



(86) Date de dépôt PCT/PCT Filing Date: 2000/06/30

(87) Date publication PCT/PCT Publication Date: 2001/01/04

(85) Entrée phase nationale/National Entry: 2001/12/20

(86) N° demande PCT/PCT Application No.: US 2000/017979

(87) N° publication PCT/PCT Publication No.: 2001/001372

(30) Priorités/Priorities: 1999/06/30 (60/141,283) US;
1999/07/01 (60/141,864) US; 2000/03/08 (60/187,890) US

(51) Cl.Int.⁷/Int.Cl.⁷ G09B 3/00, G09B 19/00, G09B 7/00,
G09B 5/00

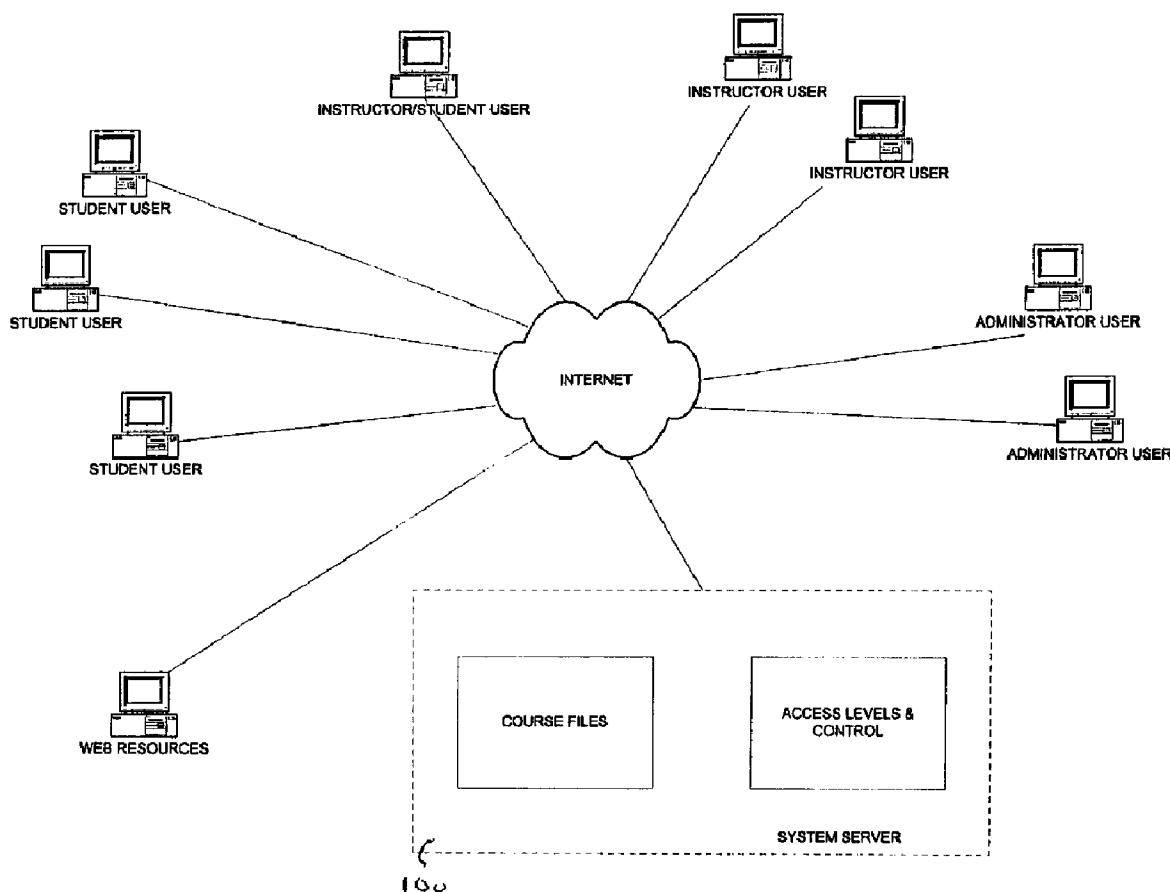
(71) Demandeur/Applicant:
BLACKBOARD, INC., US

(72) Inventeurs/Inventors:
ALCORN, ROBERT L., US;
CANE, DANIEL E., US;
CHASEN, MICHAEL L., US;
CHI, TIMOTHY R., US;
GILFUS, STEPHEN R., US;
PERIAN, SCOTT, US;
PITTINSKY, MATTHEW L., US

(74) Agent: RIDOUT & MAYBEE LLP

(54) Titre : PROCÉDES ET SYSTÈME DE SUPPORT ÉDUCATIF SUR INTERNET

(54) Title: INTERNET-BASED EDUCATION SUPPORT SYSTEM AND METHODS



(57) Abrégé/Abstract:

A system and methods for implementing education online by providing institutions with the means for allowing the creation of courses to be taken by students online, the courses including assignments, announcements, course materials, chat and



(57) **Abrégé(suite)/Abstract(continued):**

whiteboard facilities, and the like, all of which are available to the students over a network such as the Internet. Various levels of functionality are provided through a three-tiered licensing program that suits the needs of the institution offering the program (100). In addition, an open platform system is provided such that anyone with access to the Internet can create, manage, and offer a course to anyone else with access to the Internet without the need for an affiliation with an institution, thus enabling the virtual classroom to extend worldwide.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
4 January 2001 (04.01.2001)

PCT

(10) International Publication Number
WO 01/01372 A1(51) International Patent Classification⁷: **G09B 3/00**,
5/00, 7/00, 19/00

(21) International Application Number: PCT/US00/17979

(22) International Filing Date: 30 June 2000 (30.06.2000)

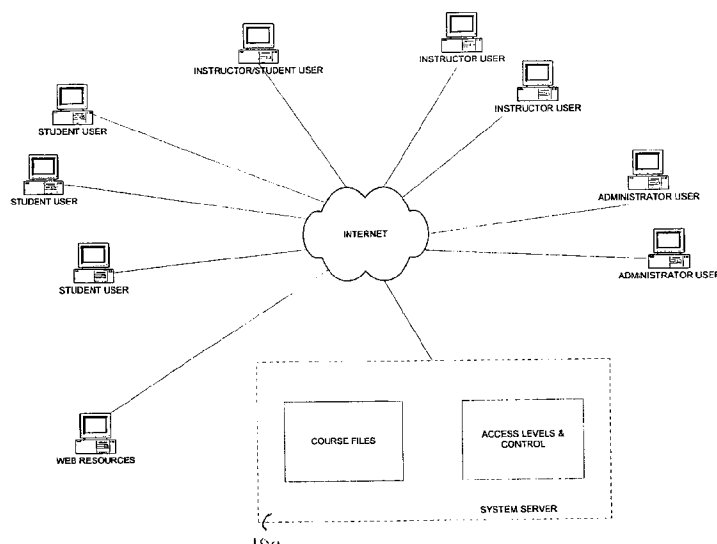
(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/141,283 30 June 1999 (30.06.1999) US
60/141,864 1 July 1999 (01.07.1999) US
60/187,890 8 March 2000 (08.03.2000) US(71) Applicant: **BLACKBOARD, INC.** [US/US]; 1899 L
Street, NW, 5th Floor, Washington, DC 20036 (US).Apt. 518, Washington, DC 20008 (US). **CHI, Timothy, R.**; 3049 Saint Regents Drive, Apt. 225, Fairfax, VA 22031 (US). **GILFUS, Stephen, R.**; 12783 Cara Drive, Woodbridge, VA 22192 (US). **PERIAN, Scott**; 3801 Connecticut Avenue NW, Apt. 207, Washington, DC 20008 (US). **PITTINSKY, Matthew, L.**; 2939 Van Ness Street, NW, Apt. 928, Washington, DC 20008 (US).(74) Agent: **BARKUME, Anthony, R.**; Greenberg Traurig, LLP, Met Life Building, 200 Park Avenue, New York, NY 10166 (US).(81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.(72) Inventors: **ALCORN, Robert, L.**; 4415 4th Street South, Arlington, VA 22204 (US). **CANE, Daniel, E.**; 1734 Q Street, NW, Apt. B, Washington, DC 20009 (US). **CHASEN, Michael, L.**; 2939 Van Ness Street, NW,(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

[Continued on next page]

(54) Title: INTERNET-BASED EDUCATION SUPPORT SYSTEM AND METHODS



(57) Abstract: A system and methods for implementing education online by providing institutions with the means for allowing the creation of courses to be taken by students online, the courses including assignments, announcements, course materials, chat and whiteboard facilities, and the like, all of which are available to the students over a network such as the Internet. Various levels of functionality are provided through a three-tiered licensing program that suits the needs of the institution offering the program (100). In addition, an open platform system is provided such that anyone with access to the Internet can create, manage, and offer a course to anyone else with access to the Internet without the need for an affiliation with an institution, thus enabling the virtual classroom to extend worldwide.

WO 01/01372 A1

WO 01/01372 A1



IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *With international search report.*
- *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

INTERNET-BASED EDUCATION SUPPORT SYSTEM AND METHODSCROSS-REFERENCE TO RELATED APPLICATIONS

5 This patent application is based on and claims filing
priority from co-pending U.S. provisional application serial
number 60/141,283, filed on June 30, 1999; co-pending U.S.
provisional application serial number 60/141,864, filed on
July 1, 1999; and co-pending U.S. provisional application
serial number 60/187,890, filed on March 8, 2000, all of
10 which are incorporated herein by reference.

TECHNICAL FIELD

15 The present invention relates generally to systems and
methods for the exchange of information between instructors
and students in an educational context. More specifically,
the present invention relates to systems and methods in
which an educational instructor interacts with one or more
non-located students by transmitting course lectures,
textbooks, literature, and other course materials, receiving
20 student questions and input, and conducting participatory
class discussions using an electronic network such as the
Internet and World Wide Web. The present invention also
relates to the provision of an infrastructure that allows
for on-line registration and tuition payment of educational
25 courses.

BACKGROUND ART

30 The ability of educators, including educational
institutions, private corporations, and institutions of
higher learning, to reach potential students has generally
been limited by geography. In most instances, a potential
student must physically move to within commuting distance or

5 onto a campus in order to have access to course instructors,
classes, and materials. Furthermore, potential students and
persons seeking knowledge of all sorts are generally limited
to proximate sources of courses of instruction, tutoring, or
10 training. Due to these limitations, a prospective student
must either seek to learn a given subject from whatever
local means of instruction is available to her or move her
household in order to be able to access her preferred
sources of instruction. Many prospective students are
15 deprived of receiving instruction from other, possibly
better-qualified instructors or institutions located outside
of their immediate locale. Similarly, educational
institutions have been limited to serving only those
students located within commutable distance of their
campuses.

The advent of networked computers and communications
has afforded a partial solution to these limitations. In
particular, the widespread use and availability of
20 electronic networks such as the Internet and the World Wide
Web have made it possible for students and educators to
overcome geographic dispersion and physical location as a
barrier to education. Using this electronic medium,
students and instructors are able to exchange information
25 including (live or transcribed) classroom lectures, homework
assignments, texts and materials, grading, (live or
transcribed) question and answer interaction sessions, and
other related information to effect a traditional learning
or educational experience regardless of physical location.

30 However, electronic networks, including the Internet,
are complex technological systems requiring the user to have

or acquire specialized knowledge in order to use them effectively. Even graphical user interfaces (GUIs) designed to enhance simplicity of use, such as that provided by the World Wide Web, may require specialized knowledge of network terminology and technical aspects. For example, an Internet user's ability to access information using that medium is significantly reduced if the user lacks understanding of how to use Uniform Resource Locators (URLs) to traverse (i.e., navigate) web pages. Slow adoption of new technology and lack of technological sophistication have a chilling effect on the widespread use of the medium in general. Applied specifically in an educational context, these chilling factors apply to instructors who, while possessing high expertise in their respective intellectual or educational fields, would be required to further attain technological knowledge necessary to effectively use the Internet to educate non-collocated students.

Furthermore, the complexity of using the Internet for educational purposes is compounded as the number of user choices required at the user interface increases because not only must the instructor and students acquire technological competency in the use of the medium, but they must in addition understand the presentation and consequences of a plethora of choices required by a particular user interface (e.g., a web page). The design of the user interface therefore can be critical in enabling widespread use of the medium in an educational context. Solutions other than the present invention may be characterized as having relatively complicated and confusing user interfaces. Users, including both students and instructors, of these other solutions are confronted with one or more web pages that typically require

WO 01/01372

PCT/US00/17979

the user to review and select a subsequent web page or function from among a large array of potential user choices, thereby complicating the user's task of interacting with the system.

5

Further, many educational institutions have existing or legacy network-based systems which students access to obtain various types of information (e.g., class schedules). The addition of yet another network-based system requires the host or sponsoring institution to incur implementation and maintenance costs associated with the installation, integration, administration, and maintenance of a new network-based system. These costs place limits on the achieving the widespread use of the medium for educational purposes.

15

Further, access, presentation, and aggregation of information contained in existing networks are provided from the institution's perspective and not an individual student's perspective. Typically, a student must access different locations or web pages of an institution's network for each datum she wishes to inspect. Further, a student may have to log-on to multiple networks in order to access different items of data. For example, a student may wish to view his financial aid status before registering for an upcoming course or semester. In existing networks, the student will have to traverse multiple web pages and possibly log-on to multiple networks in order to access his current financial aid status, assess that information, and then register online taking into account his particular information. Many similar situations are commonplace involving access to grading information, class schedule,

20

25

30

exam materials, student group meetings, and other such information. Existing systems, in short, aggregate course, institution, and student information in an institution-centric manner. This imposes a time cost upon each student/user of the existing systems in order to reduce complexity from the institution's implementation and maintenance perspectives. However, given that these time costs are imposed on all students, the sum of these distributed costs outweigh the cost savings realized by the institution in the institution-centric approach, resulting in a net loss.

Further, instructors' teaching techniques are greatly variable, based on personal preference and the subject matter being taught. Network-based systems that do not provide for a significant degree of customization are ill-suited to address to this need to accommodate diverse teaching modes in a single system.

Further, a general concern with use of the electronic network medium is that response time tends to slow as more users are added to the system. As response time becomes prohibitive, the time- and cost-effectiveness associated with using the medium for educational purposes is greatly reduced.

Many colleges and universities have stayed away from allowing on-line registration and tuition payment for a number of reasons, including high initial setup costs and incompatible billing practices.

The exception to this rule are so-called virtual

WO 01/01372

PCT/US00/17979

schools. Virtual schools traditionally charge an enrollment fee, and then offer free courses. In lieu of paying for each course taken, a student is subjected to advertising while viewing on-line course material. While such billing and income generation methods may be acceptable for companies providing on-line training, such methods are not consistent with traditional college and university billing practices. Colleges and universities typically charge a low enrollment fee and bill students on a per-credit or per-course basis.

Therefore, it is a general object of the present invention to provide a system and methods that allow users to interact with a computer network-based education support system through means of a simplified, easy-to-use user interface.

A further general object of the present invention is to provide a system that can be easily integrated with existing computer network and backend systems with minimal disruption to existing operations and systems.

A still further general object of the present invention is to provide a system that is scalable in order to accommodate increasing numbers of users, such that system responsiveness is not materially degraded as the number of users of the system grows to an increasingly large number.

A still further general object of the present invention is to provide a system and methods that can accommodate a variety of diverse teaching modes without requiring substantial modifications to the system.

A further object of the invention is to provide such a system that allows multiple types of users to access the features of the system as a function of their predefined role within the framework of the system (e.g. student, teacher, administrator).

It is a further object of the invention to provide such a system that integrates with the education platform provided therein value added services and control such as calendar, task, contact and communication functions.

These as well as other objects of the present invention are apparent upon inspection of this specification, including the drawings and appendices attached hereto.

DISCLOSURE OF THE INVENTION

In accordance with these and other objects, provided is a system for providing to a community of users access to a plurality of online courses, comprising a plurality of user computers and a server computer in communication with each of the user computers over a network. Each user computer is associated with a user of the system having predefined characteristics indicative of a predetermined role in the system. Each role provides a level of access to data files associated with a course, and a level of control over data files associated with a course. The server computer has means for storing data files associated with a course, means for assigning a level of access to each file, wherein the level of access is associated with the ability of a user to access the file, means for determining an access level of a

WO 01/01372

PCT/US00/17979

user requesting access to a file, and means for allowing access to a file associated with a course as a function of the access level of the user.

5 The user roles comprise a student role associated with a student user, an instructor role associated with an instructor user, and an administrator role associated with an administrator user (roles may be mixed; for example when an instructor of one course is also a student in another
10 course). The instructor user is provided with an access level to enable the creation and editing of a plurality of course files associated with a course. The course files include an announcement file, a course information file, a staff information file, a course documents file, an
15 assignments file, a dropbox file, an asynchronous communication file, and a synchronous communication file.

 The student user is provided with an access level to enable reading of course files associated with a course.
20 The student user is also provided with an access level to enable modification of some of the files associated with a course. Also, the user may be provided with an access level to enable creation of a student file associated with a file for which the student user is able to read. The file that
25 the student is able to read may be an assessment file created by the instructor user, and the student file created by the student user is a response to the assessment file. The assessment file may be a plurality of examination questions selected by the instructor user to assess the
30 ability of the student user. The examination questions may be selected by the instructor user from a predetermined pool of available examination questions. The examination

WO 01/01372

PCT/US00/17979

questions also may be created by the instructor user substantially at the time of the creation of the assessment file and optionally added to the pool. The student file may be reviewed by the instructor user and assigned a grade,
5 which would be made available online to the student user. The instructor user may collate the grades obtained from reviewing a number of student files, and the collated grades may be made available online to all student users associated with the course (e.g.: an average for the class, a pie or
10 bar chart, etc.).

The student will also be able to read an assignment file created by the instructor user, and the student file created by the student user is a response to the assignment
15 file.

The "digital dropbox" may contain a plurality of files transferred to the server computer from one or more student users associated with the course. The instructor user may
20 be provided with access to the files in the dropbox file, whereby the instructor user may download, edit and upload the files in the dropbox.

A user may be required to enter a login sequence into a user computer in order to be provided with access to course
25 files associated with that user. The user is then provided with access to all courses with which the user is associated after entry of the logon sequence. The user is provided with a web page comprising a plurality of course hyperlinks,
30 each of the course hyperlinks associated with each course that the user has been enrolled either as an instructor or as a student. Selection of a course hyperlink will provide

WO 01/01372

PCT/US00/17979

the user with a web page associated with the selected course; the web page having content hyperlinks and buttons to various content areas associated with the course. The content hyperlinks and/or buttons include an announcement area hyperlink, a course information hyperlink, a staff information hyperlink, a course documents hyperlink, an assignments hyperlink, a communications hyperlink, and a student tools hyperlink. Selection of the announcement area hyperlink provides a web page including a group of course announcements. Selection of the course information hyperlink provides a web page including information regarding the associated course. Selection of the staff information hyperlink provides a web page including data regarding the instructors of the associated course. Selection of the course documents hyperlink provides a web page including a listing of documents associated with the course, which may be active hyperlinks to the documents. Selection of the assignments hyperlink provides a web page including a group of course assignments. Selection of the communications hyperlink provides a web page including hyperlinks to a group of communication tools including an asynchronous communication tool and a synchronous communication tool.

In another aspect if the invention, provided is a system for providing to a community of users access to online courses, including a server computer in communication with user computers over a network, wherein the server computer has means for creating course user accounts from a file of existing user accounts associated with an external computer. In this manner, existing legacy systems having large members of user accounts stored in memory may be

WO 01/01372

PCT/US00/17979

integrated with this system without having to re-enter user data into the system (so-called batch enrollment).

5 In yet another aspect of the invention, provided is a method for providing online education, which includes the steps of establishing a course to be offered online, offering the course to be taken online to a group of student users; and providing access over the network to the course files to a student user who has enrolled in the course. The
10 establishment of the course includes an instructor user generating a set of course files for use with teaching the course, then transferring the course files to a server computer for storage thereat, and then making access to the course files available to a predefined community of student
15 users having access to the server computer over a network.

Preferably, at least one of the course files comprises a course assignment, and the student user creates a student file in response to the course assignment and transfers the
20 student file to the server computer. The instructor user accesses the student file from the server computer, reviews the student file to determine compliance with the course assignment, and the instructor user assigns a grade to the student file as a function of the determination of
25 compliance with the course assignment. The instructor user may post the grade to a file on the server computer accessible only to the student user with which the grade is associated. The instructor user may repeat these steps for a number of student users that are enrolled in the course,
30 and then perform a statistical analysis on the grades assigned to the student users. The results of the statistical analysis may be made available to the student

WO 01/01372

PCT/US00/17979

users enrolled in the course.

5 An asynchronous communication tool accessible to student users enrolled in the course may be provided for enabling asynchronous communication amongst the student users. Likewise, a synchronous communication tool accessible to student users enrolled in the course may be provided for enabling synchronous communication amongst the student users.

10 The present invention also enhances the prior art by providing a flexible infrastructure for colleges, universities, and other institutions wishing to facilitate on-line registration and tuition payment. More specifically, the present invention can accommodate different billing methods, including, but not limited to, billing on a per-credit-hour basis, and billing on a per-registrant basis. Tuition may be paid by credit card, debit card, check, or other verifiable payment method. Payment verification may be performed by the present invention, or the present invention may interface with third-parties providing payment verification services. In addition, the present invention allows on-line billing information to easily interface with a college, university, or other institution's standard billing practices. Integrating with existing billing practices simplifies transition to automated systems.

25 In addition, the present invention may be configured as an open system wherein anyone can connect to a server over the Internet and create a course online that may be taken by anyone else connected over the Internet. Thus, anyone may

create a virtual classroom available to anyone else,
regardless if they are affiliated with a particular
institution such as a University. For example, a lawyer may
create a course in patent law online, and configure the
5 system to require entry of a password to enroll. The lawyer
may then disseminate the passwords to desired students who
can enroll in the course. Alternately, the lawyer can
request the system to require payment to enroll in the
course such as by credit card.

10 BRIEF DESCRIPTION OF THE DRAWING

Figure 1 is an architectural block diagram of a
preferred embodiment of an education support system
15 according to the present invention;

Figure 2 describes a preferred embodiment implementing
load balancing to achieve scalability;

Figure 3 illustrates the functioning of a preferred
embodiment of an engine/registry model according to the
20 present invention;

Figure 4 shows a preferred user interface according to
the present invention;

Figure 5 shows a screen shot of the home page that a
user will view;

25 Figure 6 is a screen shot of a web page showing the
course list and course catalog available to student users;

Figure 7 is a screen shot of the default view for a
course web site;

Figure 8 is a screen shot of the announcements provided
30 to a student user;

Figure 9 is a screen shot of the course contents
window;

Figure 10 is a screen shot of the assignments web page;

Figure 11 is a screen shot of the course documents web page;

Figure 12 is a screen shot of the communication center web page;

Figure 13 is a screen shot of the asynchronous discussion board web page;

Figure 14 is a screen shot of the student tools web page;

Figure 15 is a screen shot of the student drop box web page;

Figure 16 is a screen shot of the instructor's control panel web page;

Figure 17 is a screen shot of the announcements web page;

Figure 18 is a screen shot of the course information web page;

Figure 19 is a screen shot of the course tasks web page;

Figure 20 is a screen shot of the instructor library web page;

Figure 21 is a screen shot of the digital dropbox web page;

Figure 22 is a screen shot of the course gradebook web page;

Figures 23A and 23B are a screen shot of the course statistics web page;

Figure 24 is a screen shot of the advanced course and portal manager web page;

Figure 25 is a screen shot of the community web page;

Figure 26 is a screen shot of the services web page;

Figure 27 is a screen shot of the calendar web page;

Figure 28 is a screen shot of the email web page;

Figure 29 is a screen shot of the create a course web page;

Figures 30A and 30B are a screen shot of the create user web page;

Figure 31 is a screen shot of the web resource web page;

Figure 32 is a further screen shot of a web resource web page;

Figure 33 is a screen shot of the virtual chat web page;

Figure 34 is a block diagram illustrating information passed from a course registration server to a payment server;

Figure 35 is a sample of a payment form;

Figure 36 is a block diagram illustrating interaction between a payment server and a payment validation server;

Figure 37 is a sample of a payment information page;

Figure 38 is a block diagram illustrating post-order processing;

Figure 39 is an overall block diagram of the system.

BEST MODE FOR CARRYING OUT THE INVENTION

Referring to Figure 39, the present invention comprises a system and methods for the exchange of course content and related information between non-located instructor users and student users. An instructor user interacts with one or more non-located student users by using the system and methods of the present invention to, without limitation, transmit course files including course lectures, textbooks, literature, and other course materials, receive student questions and input, and conduct participatory class

discussions using an electronic network such as the Internet or World Wide Web. Access to the course file is controlled by access levels and control logic, to ensure integrity and security of the system. Also, administrator users have
5 access to the system to perform administrative tasks as defined herein.

System Architecture

The system architecture of a preferred embodiment of an
10 education support system 100 according to the present invention is presented in Figure 1. Referring now to Figure 1, education support system 100 comprises application subsystems 110, a web browser 120, a web host server 130, a database subsystem 140, and core subsystems 150. Web host
15 server 130 further comprises a shell service 131. Applications subsystems 110 further comprise a content registry 111, a tool registry 112, a course registry 113, one or more content engines 114, one or more tool engines 115, and one or more course engines 116. Core subsystems
20 150 further comprise a core engine 151, an access manager 152, a user interface (i.e., UI) manager 153, a user manager 154, a group manager 155, an event manager 156, a log manager 157, and a connection manager 158.

25 In a presently preferred embodiment, education support system 100 is implemented in a client-server network topology. Users (who may have one or several roles such as a student, instructor, teaching assistant (TA), or administrator) access and interact with education support
30 system 100 via web browser 120. More specifically, a user accesses application subsystems 110 and core subsystems 150 through shell service 131 servlet providing a standard

WO 01/01372

PCT/US00/17979

Internet interface including, but not limited to, TCP/IP, HTTP, SMTP, and FTP to the user via web browser 120 running on a standard computing platform such as a personal computer or workstation. Specifically, shell service 131 servlet
5 uses the URL-encoded information contained in HTTP requests received from web browser 120 clients to invoke the corresponding requested application subsystem 110 or core subsystem 150. Shell service 131 servlet also provides user authentication and session management.

10

Application subsystems 110 function in conformance with an engine/registry model 300 as described in Figure 3. Generally, engine/registry model 300 comprises one or more engines 301, a registry 302, and a context factory 303.
15 Engines 301 include, but are not limited to, content engine(s) 114, tool engine(s) 115, course engine(s) 116, and core engine 151. Registries 302 include, but are not limited to, content registry 111, tool registry 112, and course registry 113. Course engine(s) 116 creates a course
20 by associating together a set of educational materials to which a student user has access, by organizing references to these informational items as contained in content registry 111. Specifically, course engine(s) 116 queries content registry 111 for an index to the content engine 114
25 associated with a particular resource being requested by a user.

30

Content engine(s) 111 includes an assessment engine that generates quizzes to assist and instruct users in the use of education support system 100. For example, one such quiz provided by an assessment engine of education support system 100 provides step-by-step instructions to an

instructor for building a course. The quiz is then administered online to the instructor to allow him to build a customized course to be provided using education support system 100.

5

Unlike content engines 111 which represent actual course content, tool engine(s) 115 generally comprise installable programs that provide capabilities available for use with a plurality of courses and not fixedly associated with any particular course or courses.

10

Instructors have different preferred modes of teaching. Further, the same instructor may emphasize different modes of teaching depending upon the subject being taught. For example, some instructors emphasize individual homework while others prefer a group or collaborative approach. Education support system 100 supports a variety of teaching methods. By invoking a particular set of tool engines 115 during interaction with the assessment engine, an instructor can customize a course offering to conform to her preferred mode of teaching. An example of a tool engine 115 is the chat/whiteboard communication tools (synchronous and/or asynchronous) provided by education support system 100 that allows for student group interaction and collaboration associated with a given course. Other tools include, but are not limited to, announcements for broadcast of group-oriented messaging, a calendar mechanism for storing date-related events and information, a discussion board for posting questions and answers in a threaded discussion format, notes-editing, group pages, and email services. Further capabilities provided by education support system 100 include, but are not limited to, a catalog listing of

15

20

25

30

WO 01/01372

PCT/US00/17979

all courses available, means for student users to enroll in either open enrollment or closed enrollment situations, means for course creation including course templates and course themes, a course/page editor and viewer, a site page editor and viewer, means for making and disseminating announcements, a calendar function, a chat board in the nature of an online discussion, a white board allowing group interaction and display of free-form information using, for example, Microsoft Paint™, means for sending email between instructors and students and groups of students, a list of course members and links to their web pages, a list of groups and links to their web pages, a file sharing area, means for providing assignments to student users, means for conducting a variety of types of student assessments (i.e., testing), means for providing lesson material in sequential format, means for adding and removing users, help documents, maintaining a grade book and progress tracking, links to personal web pages or home pages, and a resource library containing references to all uploaded content. Course templates allow instructors to easily reuse a course structure for subsequent courses. Course themes allow the instructor to affect the look and feel of the course site.

Further, a presently preferred embodiment of education support system 100 supports a plurality of environments 400 in a single application. Examples of different environments 400 supported include the personalized web page of student-centric information accessed by a student user and the administrator's environment used for maintenance of the system. Certain parts of the education support system 100 application are consistent across all supported environments 400, while the appearance to the user may vary for different

environments 400. An environment 400 is defined by console frames that surround the application areas. An example of an environment 400 defined by a four-frame page as shown in Figure 4 comprises a console navbar 401, and console top 5 402, a toolbar 403, and content 404. Console navbar 401 and console top 402 are controlled by a console frameset, while toolbar 403 and content 404 are controlled by a separate frameset. For example, toolbar 403 "buttons" are always located in the top frame of an application area, regardless 10 of the environment 400. This approach allows users, and especially instructors, the ability to customize their course offerings while conforming to consistent user interface features that allow application areas to be shared across environments 400. Student users and instructors 15 interact with education support system 100 via the same basic environment 400 format.

Context factory 303 contains information mapping a user to one or more courses associated with that user.

20 Access control manager 151 creates an access control list (ACL) for one or more subsystems in response to a request from a subsystem to have its resources protected through adherence to an ACL. Education support system 100 25 provides multiple levels of access restrictions to enable different types of users to effectively interact with the system (e.g., access web pages, upload or download files, view grade information) while preserving confidentiality of information.

30 User manager 154 integrates the student-centric information with existing network-based systems of an

associated educational institution. In a presently preferred embodiment, user manager 154 comprises a runtime component and a batch component that periodically access and extract information contained in external institution
5 databases in order to maintain current student-centric information. User manager 154 facilitates integration of education support system 100 with existing or legacy network-based systems, including proprietary institutional electronic networks and systems related to grades,
10 registration, course schedules, financial aid, etc. without requiring modifications to existing systems or security procedures.

In a presently preferred embodiment, application
15 subsystems 110 and core subsystems 150 interface with database subsystem 140 via the Java Database Connectivity (JDBC) standard interface to allow use of any relational database including, but not limited to, SQL and DB2 Universal Database standards.

20 Scalability is provided by the modular system architecture described in Figure 1, and, in a preferred embodiment, through use of a load balancing server 200 as shown in Figure 2. As users are added to the system and
25 access the system as web browser 120 clients, additional web server hosts 130 may be added to the overall system to provide a matching increase in system capacity. Load balancing server 200 allocates new web browser clients 120 to the least-busy web server host 130 for servicing. By
30 thus balancing the load across all web server hosts 130, education support system 100 prevents response times from become unacceptably long for any one given user. In a

WO 01/01372

PCT/US00/17979

presently preferred embodiment, load balancing server 200 maintains one or more metrics concerning the percent utilization for each web server host 130 and selects the least-busy web server host 130 based upon application of a load balancing algorithm to these utilization metrics.

In a presently preferred embodiment, upon logging onto education support system 100, shell service 131 servlet renders and presents to the user (via web browser 120) a personalized web page comprising a student-centric aggregation of data that may include, without limitation, personal class schedules, grades, a rolled-up or consolidated calendar, links to related tools, student group events for groups of which a particular student is a member, and class announcements.

Education support system 100 executes on a variety of computing platforms including, but not limited to, UNIX™ servers, NT™ servers, Solaris™, HP™, and Linux™. Education support system 100 supports popular web browsers including, but not limited to, Netscape Navigator™ and Microsoft Internet Explorer™, and, in a preferred embodiment, does not require plug-ins at the web browser client.

In a presently preferred embodiment, an automated upload or import capability is provided in which a user may upload a file to the system and system presents or displays the information contained in the uploaded file in a manner that preserves the grouping of the information, including fields and other categorization, based on the file type. Education support system 100 provides a standard import file format to accomplish this preservation of native grouping of

information. In a presently most preferred embodiment, the automated upload capability imports an uploaded file in both native and HTML formats, maintaining the file formats associated with the native format for the native formatted file and converting the native format into HTML formats for the HTML formatted file.

Education support system 100 supports a variety of business models. For example, an institution may charge each student for courses taken via education support system 100; or, an instructor may use education support system 100 to process individual student tuition payments by providing links to e-commerce facilities.

Thus, a system and methods have been shown that that allow users to interact with a computer network-based education support system through means of a simplified, easy-to-use user interface, and that can be easily integrated with existing computer network and backend systems with minimal disruption to existing operations and systems. The disclosed system and methods is scalable in order to accommodate increasing numbers of users, and can accommodate a variety of diverse teaching modes.

Three Tier Functionality

The present invention will now be described in further detail. The invention is embodied in four embodiments that represent three levels of functionality of the system that can be provided to and by an institution, and one embodiment that can be offered to anyone on the Internet. One embodiment embodies a "first tier" functionality and incorporates the basic system, referred to as the Course

WO 01/01372

PCT/US00/17979

Manager. The Course Manager provides course management system tools that enable instructors to provide their students with course materials, discussion boards, virtual chat, online assessments, and a dedicated academic resource center on the Web. As explained further below, the Course Manager includes personal information management tools, course content management tools, course communication and collaboration tools, assessment tools, academic Web resources, course management tools, and system management tools.

A "second tier" embodiment incorporates all of the functionality of the basic embodiment in an epicentric or portal model, also known as the Course & Portal Manager. This embodiment expands beyond the first tier Course Manager, and provides customized institution-wide portals for faculty, students, staff, and alumni with access to numerous personalized news and information services from across the Web. The platform can be customized with institutional branding and a tailored look and feel. It enables institutions to develop online communities, Web-based email, calendar, announcements and tasks. It also allows for a central access point to all of the institution's online services. In addition to the features of the Course Manager, the Course & Portal Manager includes enterprise database support, customizable portal modules and information services, web-based e-mail system, community management, institutional services management, extended customization for institutional branding, institution-wide content sharing and management, and course e-commerce management.

The third embodiment is a third tier system, known as

WO 01/01372

PCT/US00/17979

the Advanced Course & Portal Manager. This embodiment incorporates the complete end-to-end "e-Learning" solution. In addition to the Course and Portal Manager, this third tier provides advanced Java-based API's for unifying diverse online campus systems into one integrated platform allowing for user-driven single log-in service delivery, as well as capabilities that allow each school, department or campus within the institution to maintain its own customized environment. Thus, this is the fully functional embodiment that includes all the features and functionality of the first and second tiers and adds certain integration technologies that allow integration of the invention with existing enterprise systems, such as for downloading student databases, etc. as defined further below. This includes a snapshot user management API, an event-driven (real-time) user management API, an end user authentication (security) API, and a network protocol for passing user authentication data.

It is contemplated that each tier would be offered to institutions in a licensing program that would best suit the needs and budget of the institution.

A fourth embodiment of the invention is operated as a publicly available web site on the Internet, that may be accessed by anyone, whether they are affiliated with an institution or not. In this embodiment, anyone on the web can create a course, enroll in a public course, etc. as explained further below. This provides for widespread dissemination of tools and utilities that enable anyone to generate his own course that can be taken by virtually any student.

As further explained herein, the course management tools featured in the present invention allow instructors to monitor, control and customize their course web sites from a web browser interface. The Course Control Panel provides a robust and easy-to-use interface for such course management. The system allows instructors to customize the names of course web site navigation buttons to suit their needs and requirements. The system also allows the instructor to add or drop individuals or groups of students from a course as required. The system features extended student enrollment option, such as a limited-time self-enrollment (e.g. certain dates only for the self-enroll feature), password-protected enrollment, and defined course duration (e.g. for self-paced study). Courses may be recycled between academic terms by automatically resetting discussion boards, assessment, and other content areas. In addition, the instructor can track student progress, grades and content usage through the system.

As further explained herein, the content management tools featured in the present invention allow instructors to post course documents, staff information, assignments, etc. Text may be typed directly into a form, or existing files may be accessed and uploaded automatically. Documents such as word processing files, spreadsheets, slide presentations, graphics, audio and video clips, etc. may be uploaded in this manner. Streaming multimedia may provided interactivity between the student and the course. Pop-up maps provide easy course site navigation, thus enriching the teaching and learning environments.

The communication and collaboration tools enhance the

WO 01/01372

PCT/US00/17979

interaction between the students and instructors with asynchronous discussion boards as well as synchronous chat tools. Online discussions may be managed wherein messages are sortable by date, author, title, etc., and may be archived and printed. A digital dropbox is a file sharing utility that allows sharing of documents between users. Virtual office hours may be held, and even field trips conducted online with these tools.

The assessment tools in the present invention increase student preparedness, measure student progress, and customize lessons by creating and administering quizzes and surveys. Provided is an easy to use, step by step process to create the quizzes and surveys, wherein the instructor may mix and match multiple question types such as multiple choice, multiple correct, true/false, matching, ordering, fill in the blank, and essays. Multimedia or other attachments may easily be included with the assessment questions. Questions may be randomized and re-used from assessment pools. Tests provided to students may be password protected and timed, and may provide instant feedback to students. Advantageously, statistical reports may be created from the assessments and student answers.

The personal information management tools in the present invention allow students, instructors, administrators and all other users to access basic course, personal, and institutional data through a user-centric "My Institution" screen. The user may view announcements from multiple courses in one central location, and maintain personal calendar, address book, user directory and to-do lists.

The present invention also provides for access to a plethora of academic resources that supplement the student's online education experience. The user may browse
5 discipline-specific information, resources and communities linked to each course website. These academic resources may be customized and personalized to fit the users' needs.

The system management tools available with the present
10 invention allow system administrators to monitor, control and customize an institution's online teaching and learning environment from the web browser. The system administrator may control security permissions and enable/disable features for numerous user roles. Batch user enrollment (and
15 unenrollment) may be performed system wide. Preferences and options may be managed on multiple courses, all from within a central system administrator panel. The system administrator may also track and report faculty, student and course statistics, may plan and manage system hardware
20 requirements by assigning instructors with pre-assigned disk quotas for content storage, and may employ system-wide announcements to broadcast messages to users about system maintenance or institutional announcements.

25 In the Course & Portal Manager embodiment, the enterprise database support provides support for tens of thousands of users across an entire institution or system of institutions. User and course data may be managed efficiently and effectively. Moreover, large volumes of
30 transactions may be managed efficiently and effectively. The "My Institution" interface includes portal and community functionality along with quick access to web email, course

and institutional announcements, and links to other campus departments. Administrators may enable or disable portal modules and establish required and optional modules from the portal options menu bar. Administrators may also assign
5 different portal default settings to different user roles (e.g. students get different portals than instructors).

Course e-commerce management functionality allows institutions to set prices and charge fees for course enrollment directly through the "e-Learning" platform.

10 In the Advanced Course & Portal Manager embodiment, the snapshot user management tool allows scheduling of one-time or periodic (i.e. hourly, daily, weekly) data integration from existing student information systems, automating course population and keeping the "e-Learning" environment
15 synchronized with administrative and student data. Moreover, the end-user authentication enables a single login environment for the institution portal for all students, instructors, administrators and staff, which streamlines all campus services into a single web portal environment.

20 The present invention will now be described in further detail and embodiments. Figure 5 shows a screen shot of the home page 500 that a user will view, which is customizable in accordance with the requirements and desires of any user.
25 The home page may also be institutionally branded, so that the "Your Institution" logo 504 shown in Figure 5 would display the name of the institution that has licensed the product (i.e. "New York University"). The home page also provides the user with direct access to personal, course,
30 and institutional tools. As an added feature, the system enables each user to select from a large number of news and

information services, so that everyone who uses the system will have access to the most recent and relevant information for them. All of this functionality is provided in one place - the home page - so that the institution can provide
5 a sense of community on campus, with courses, and with a view to the external information sources.

By selecting the "Courses" tab 502 shown in Figure 5, the user will be linked to a Course page 600 as shown in
10 Figure 6, which provides direct links to the courses that they teach (602, 604) and/or are enrolled in (606, 608, 610). To access the course website, the user will click on the course title (and 602, 604, 606, 608 or 610), he is automatically linked to a web page associated with that
15 course. The user also has the opportunity to browse the course catalog 612 by selecting the links on the right side of the page 600, where courses are listed according to category. The user may also search through the course search engine by selecting the Browse Course Catalog Link
20 614.

For example, by selecting the link 602 for the Introduction to Music course, which the user in this example is teaching, the user is shown the web page 700 illustrated
25 in Figure 7. The default view for the course web site 700 in this embodiment is the Announcements page 702, as shown in Figures 7 and 8. As seen at the lower part of the screen in Figure 8, the user has the option of selecting various types of views by filtering out certain time-based
30 announcements (i.e. today, last 2 weeks, last month, or all) by selecting button 802. The Announcements section can also be linked to after the user has left that page (i.e. is

viewing another part of the course web site) by simply clicking the Announcements button 804 on the navigation toolbar 806 on the left of the web page.

5 Within the course website environment, the user is able to access all of the relevant course material and communication features as shown herein. The entire course outline may be displayed in a separate browser window 900, wherein the course contents are available for perusal and
10 hyperlinking as desired. Figure 8 shows the entire web page for Introduction to Music in two parts (an upper part and a lower part, which of course is scrollable as desired). As can be seen, one of the function buttons provided is labeled "Course Map" 808, which upon being clicked will popup the
15 Course Contents window 900 shown in Figure 9 (in an expanded browser window). As can be seen, the user will be able to expand or collapse the various headings provided in order to drill into the entire course contents as currently configured. So, for example, the user can expand the
20 Assignments section 902 and get a linkable list of all the assignments that have been created for the course to date. Any of the assignments may then be clicked for easy access thereto. This separate window 900 is especially
25 advantageous since it allows users to browse the entire course, regardless of their current location in the web site.

 Thus, by selecting any of the Assignments links 902, the user would be linked to the web page 1000 set forth in
30 Figure 10. This web page lists each assignment that has been compiled for the course, each of which can be linked to web pages that contain the full details of the particular

assignment. The assignment page 1000 shown in Figure 10 may of course also be viewed by clicking the "Assignments" button 804 on the toolbar at the left of the course home page shown in Figure 8. In general, any of the functions that are provided by toolbar buttons on the navigation bar at the left of the course home page will be available in any page accessed for that site, so that easy navigation may be had and the user may jump around and visit any desired portion of the course web site no matter where the user is currently located. Likewise, the Course Contents window provides similar functionality as described above.

As shown in Figure 10, folders that have quizzes and surveys may be linked to by viewing the assignments web page. Clicking on these folders will present the student and/or instructor with a quiz that may be taken online, wherein the answers may be graded automatically, in real-time, as soon as the student has finished the quiz. This assessment functionality will be explained in greater detail below.

In general, assignments may be provided in virtually any type of media that the instructor has at his disposal. For example, shown in Figure 10 is a link 1002 to a multimedia presentation for "Physics in Music", which will give the student a content-enriched lesson that will be useful, prior to the next lesson. Assignments may also be as simple as a text based file that the student would read in preparation for the required class session.

In addition to selecting the Assignments page 1000 or the Announcements page 700, the user may select the Course

Information button 1004 on the toolbar. This will link the user to a web page that will list information provided by the instructor that is useful to the student, such as an introductory welcome message, links to helpful resources, etc. Resources otherwise found on other parts of the course web site may also be shown here if desired by the course web site developer. Links may be in the form of URLs to other web pages or resources, or to folders that include groups of logically related resources.

Selection of the Staff Information navigation button 1006 will provide the user with a web page that will list each instructor, TA, professor, etc., along with an abstract listing office hours, address, telephone number, etc. on each, as well as a link that be clicked to send an email. This gives the student with quick, easy access to any instructor as may be desired throughout the course. Images and other types of multimedia files may also be made available at this page for enhanced content viewing.

The user may select the "Course Documents" link 1008 shown in the navigational toolbar, after which the web page 1100 on Figure 11 is provided for that course. This provides the user with immediate access to all documents relevant to the course. As a student, the user has access to all of the course materials, including additional links to information on the web that will enhance the instructional experience. As an instructor, the user has the ability to post documents of numerous file formats and from disparate locations.

By selecting the "Communication" tab 1010 shown in

Figure 10, the student is provided with the Communication Center web page 1200 as shown in Figure 12. In this area, the user has at his disposal many different ways of establishing communications with other users of the system as well as accessing other areas of the system for various types of information. Thus, the user has access to an email utility 1202, a student roster list 1204, a list of student homepages 1206, a discussion board 1208, a virtual classroom chat 1210, and a group pages link 1212.

Selection of the Send E-Mail link 1202 loads a web page with various links that allow the user to send email to individuals registered for the course, to students only, to instructors only, etc. The email function is accomplished via web-based email and allows for users to send attachments, etc. as in many existing email packages available today. Selection of the Student Roster link 1204 displays a web page that lists all of the students registered for the course, along with contact information if allowed by the student (such as phone number, address, email address, etc.). Selection of the Student Pages link 1206 provides a web page with links to the homepage for each student in the class.

Another very effective communication tool is the asynchronous Discussion Board 1300, as shown in Figure 13, which is displayed by the student selecting the Discussion Board link 1208 of Figure 12. Here, students can access this for threaded discussions that are archived for easy retrieval. By using the discussion board, students can help each other learn even more easily outside of regular class hours. It can also be used as an effective method for

instructors and TAs to use as a tutorial tool for out-of-class questions and discussions that need to be saved for the purpose of sharing with the rest of that class. This utility operates in accordance with techniques well known in the art.

By clicking on the Virtual Chat link 1210, the student is provided with a web page 3300 as shown in Figure 33, labeled "virtual chat". That is, each course has its unique chat area built into the course site. Students can engage in chats about the course, collaborate on assignments, and share information beyond the boundaries of the classroom or posted materials. The instructor can monitor the chats or actively engage in discussions. This real-time virtual chat feature can also accommodate a whiteboard mode.

Selection of the Group Pages link 1212 displays a web page that lists various groups of users that are grouped by special interests (such as music lovers, bookworms, sports fans, etc.). Access to these groups is a definable parameter that is set by the system administrator.

Selection of the External Links button 1012 will display a web page that is provided with URLs for relevant content that the instructor deems may be useful to the student community. For example, in a law course, links may be provided to various legal research web sites, a Congressional web page, etc.

Selection of the Student Tools button 1014 will display a web page 1400 of associated links as shown in Figure 14. These links include various tools needed by the student,

such as the Student Drop Box 1402, Change your Information 1404, Check Your Grade 1406, Edit Your Homepage 1408, Student Calendar 1410, and the Student Manual 1412.

5 By clicking the Student Drop Box link 1402, the student is provided with a web page that will allow control and access to the student's digital dropbox, which is a folder of files that the student can exchange with the course instructor. As shown in Figure 15, the dropbox web page
10 1500 allows the student to type in box 1502 the resource location of a file that he wishes to provide to the instructor, or to browse his computer's hard drive with button 1504, network drive, etc. in accordance with well known techniques to locate the file and insert the
15 appropriate pointer. Clicking the Send File button 1506 will finish the task of uploading the file. A list 1508 of uploaded files that exist in the student's dropbox is also set forth in this page, along with a control link 1510 that enables the removal of a file. By using this utility, the
20 student can submit documents such as term papers to the instructor, who can then read and post comments to the file for return to the student and review.

 Selection of the Change Your Information link 1404
25 provides the student with a web page that sets forth his personal data, such as name, address, email, phone number, password, etc. In addition, certain system preferences may be set at this location. Similar to this link is the Edit Your Homepage link 1408, which will allow the student to
30 access his homepage and make modifications as he desires (e.g. change a JPEG picture on the page, change hotlink list, etc.)

Selection of the Check Your Grades link 1406 will deliver a web page that shows the grades that the student has been assessed in the course, such as for exams, quizzes, term papers, projects, assignments, etc. The student may be able to link to the specific exam or paper through this utility in order to review the exam again, which may be useful for example in preparing for a final exam. The instructor may also provide to the student a statistical review of the entire class so that the student has a better feel for the grade he may receive (for example, the class median, mean, curve data, etc.).

The Student Calendar button 1410 will provide well known PIM (personal information management) functionality to the student. The Calendar web page can display calendar events in a graphical display for that course, all the student's courses, all institution events, as well as personal calendar events programmed by the user. Thus, different entities can program calendar events, which can be selectively displayed by the student by selection of display functions on the page. For example, the instructor can program the calendar events for the course, and an administrator can program calendar events for the entire campus, and these will be displayed on the student's calendar since he is registered for the course. This provides the student with a greater ability to manage his calendar than has been available in the past.

The final button on the Student Tools web page is the Student Manual link 1412, which when selected provides the student with access to an online manual that may be used for

a "help" reference in navigating the web site.

Located below the navigation button toolbar is a group of control buttons 1420. The Resources button 1422 links directly to a web page of related online resources to assist with course-related issues, as described further below. The Course Map button 808 gives a separate browser window with direct access to the course contents, as explained above. The My Blackboard button 1424 gives access to "My Blackboard" functionality as explained below. The Search button 1426 enables the user to search all course materials by criteria and keyword(s). The Logout button 1428 logs the user out of the current course. There may also be an Enroll in this Course button to allow students to register themselves in courses (this button is only visible when the student accesses as a guest a course in which he is not enrolled).

Instructor Functionality

The instructor is provided with essentially the same functionality and control as is the student user, with additional functions defined herein. That is, the instructor is provided with a complete set of navigational buttons for accessing announcements, course information, staff information, course documents, assignments, communication tools, external links, and student tools for a given course that he is teaching. The control panel is also given to the instructor to enable display of a set of links to course management and development tools that are available to an instructor.

The instructor's control panel web page 1600 is shown in Figure 16. This control panel 1602 provides the instructor with many features that are useful in managing the course he instructs. The control panel is divided into
5 Content Areas 1604, Course Tools 1606, Course Options 1608, User Management 1610, Assessment 1612, and Assistance 1614, as set forth below.

Content Areas

10 The Announcement link 1616 displays a web page 1700 as shown in Figure 17 that will set forth all of the announcements that have been posted for the course, the author (i.e. which instructor, if there are more than one
15 authorized to access this area) of the announcement, and a modify button 1702 and a remove button 1704. An add announcement button 1706 is also provided, which displays a web page with a blank message field that the instructor fills in and submits to the server. The newly added announcement
20 will then be posted to all students registered in the class.

The Course Information link 1618 displays a web page 1800 as shown in Figure 18 that will set forth all of the course information documents or folders that have been
25 posted for the course, and a modify button 1802 and a remove button 1804. An add item 1806 or add folder button 1808 is also provided, which displays a web page with various fields that the instructor will fill in to define the course information entry. After submitting the new entry to the
30 server, the new course information is posted to all students registered in the class.

The Staff Information link 1620 displays a web page that will set forth all of the staff entries (i.e. instructors, Tasks, etc.) that are involved with the course, and a modify button and a remove button for each entry
5 similar to those shown in Figure 18. An add item or add folder button is also provided, which displays a web page with various fields that the instructor will fill in to define the new staff item entry. Fields are also provided for links to each staff member's email address, web page,
10 etc. Images of the staff member may also be inserted in the entry. After submitting the new entry to the server, the new staff information is posted to all students registered in the class as explained above.

15 Similarly, the Course Documents link 1622 displays a web page that will set forth all of the course documents or folders that have been posted for the course, and a modify button and a remove button as discussed above. An add item or add folder button is also provided, which displays a web
20 page with various fields that the instructor will fill in to define the course documents entry. The document may be uploaded directly to the server for later access by the student, or a link to an external referenced resource may be provided (i.e. a URL). After submitting the new entry to
25 the server, the new course information is posted to all students registered in the class as explained above.

Likewise, the Assignments link 1624 displays a web page that will set forth all of the course assignments or folders
30 that have been posted for the course, and a modify button and a remove button. An add item or add folder button is also provided, which displays a web page with various fields

that the instructor will fill in to define the course assignment entry. The assignment entry may be uploaded directly to the server for later access by the student. After submitting the new entry to the server, the new course assignment is posted to all students registered in the class as explained above.

Also, the External Links link 1626 displays a web page that will set forth all of the external links or folders that have been posted for the course, and a modify button and a remove button. An add item or add folder button is also provided, which displays a web page with various fields that the instructor will fill in to define the external links entry. The external links entry may be uploaded directly to the server for later access by the student. After submitting the new entry to the server, the new external link page is posted to all students registered in the class as explained above.

Course Tools

Under the Course Tools section 1606, the Course Calendar link 1628 displays a web page that will set forth all of the calendar events that have been posted for the course, and a modify button and a remove button. An add item button is also provided, which displays a web page with various fields that the instructor will fill in to define the new calendar item entry (i.e. description, date, time, etc.). The calendar entry may be uploaded directly to the server for later access by the student. After submitting the new entry to the server, the new calendar page is posted to all students registered in the class as explained above.

The Course Tasks link 1630 displays a web page 1900 as shown in Figure 19 that will set forth all of the tasks that have been posted for the course, and a modify button 1902
5 and a remove button 1904. An Add Task button 1906 is also provided, which displays a web page with various fields that the instructor will fill in to define the new task entry (i.e. description, date, time, etc.). The task entry may be uploaded directly to the server for later access by the
10 student. After submitting the new entry to the server, the new tasks page is posted to all students registered in the class as explained above.

The Send Email link 1632 displays a web page that is
15 similar to the one the user will be provided with in his email function (i.e. allows selection of individual users associated with the course, certain predefined groups of users such as all students, etc.)

The Instructor Library link 1634 displays a web page
20 2000 as shown in Figure 20 that will set forth all of the folders and files that have been posted by the instructor for the course, and a modify button 2002 and a remove button 2004. These materials are accessible to instructors only
25 (professors, TAs, etc.), and not to students directly. An Add File button 2006 and an Add Folder 2008 button is also provided, which displays a web page with various fields that the instructor will fill in to define the new entry. In addition, the instructor is able to select the Add From
30 Institution button 2010 to select a new reference that is available from a pool of references made available to all instructors from the institution. The new entry may be

uploaded directly to the server for later access by the instructors associated with the course. After submitting the new entry to the server, the new Instructor Library page is posted to all instructors associated with the course.

5

The Virtual Classroom link 1636 displays a web page that provides a link to either launch a virtual classroom (and thus participate in real-time, synchronous classroom sessions), or to view the classroom archives (view previous classroom sessions and/or download these sessions to the instructor's computer). Each course includes a Virtual Classroom, which is a synchronous chat room for student and group communications. The Virtual Classroom can be used to hold "live" classroom discussions, TA sessions, and office hour type question/answer forums. One can even have guest speakers and subject matter experts talk with the class in the Virtual Classroom.

10

15

A Virtual Classroom contains several distinct areas. The Whiteboard Space is where web pages are displayed, which is the large center area. One can also write or draw on this space using the drawing toolbar. The Menu Bar is used to change the information that appears on the whiteboard space, such as selecting a font to use on the whiteboard space and moving an object on the whiteboard space behind another object. One can also prepare lessons, navigate slides displayed on the whiteboard space, and clear the Group Discussion tab and Questions and Answers tab (refer to the Tab Panel description for further information on these tabs). The Application Tool Bar contains tools for navigating web pages. The Location Field is used to enter the URL of a web page the user would like to use during the

20

25

30

Virtual Classroom session. The web page is then displayed on the whiteboard space. Users can also write or draw on the web page with the drawing toolbar. The Drawing Toolbar is used to write and draw on the whiteboard space. The Status Region is where status messages are displayed at the bottom of the Virtual Classroom window. The Tab Panel is used to chat with students, respond to students' questions, control classroom behavior, and view information about the students in the Virtual Classroom.

10 The following panels are available:

Name of Tab	Purpose
Group Discussion	Use this tab to talk with the students in the Virtual Classroom.
Questions and Answers	If a student uses his/her Questions tab to submit a question to the instructor, the instructor can then answer the question using the Incoming Questions tab. Thereafter, the instructor can view a log of their dialogue regarding the question on the Questions and Answers tab.
Participant Information	Use this tab to learn about the students in the Virtual Classroom, such as their names.
Slides	Use this tab to prepare and present a series of slides. (See Options in Preparing Lessons). The tab is only available to the Instructor.
Incoming Questions	If a student uses his/her Questions tab to submit a question to the instructor, the instructor can then answer the question using the Incoming Questions tab. Thereafter, the instructor can view a log of their dialogue regarding the question on the Questions and Answers tab. The Incoming Questions tab is only available to the instructor.
Access Control	Use this tab to control students' ability to conduct the four Virtual

Classroom activities: Question, Chat, Drawing, and Navigating. The tab is only available to the instructor.

Selection of the Discussion Board link 1638 displays a web page that provides links to the available discussion boards that are associated with the course. A discussion
5 board is another communication tool to use in a classroom setting. This feature is similar to Virtual Chat, but is designed for asynchronous use, so users do not have to be available at the same time to have a conversation. An additional advantage of the discussion board is that user
10 conversations are logged and organized. Conversations are grouped into forums that contain threads and all related replies.

Selection of the Digital Dropbox link 1640 displays a web page 2100 as shown in Figure 21 that lists the files
15 that exist in the digital dropbox. The Digital Dropbox is a tool that the instructor and students can use to exchange files. The Dropbox works by "uploading" a file from a disk or a computer to a central location. A participant can then come and "download" it to work locally. The Digital Dropbox
20 is used to exchange materials between a single student and the instructor. Information that needs to be posted for all students should be placed in the Course Documents area using the Page Editors.

Individual student access to the Dropbox is available
25 from the File Transfer Area located in Student Tools area on the Course. Students also have group access to a private dropbox from a group homepage.

The web page 2100 displayed lists the current files in the dropbox, which are the files that participants have sent to the user. Files posted here can be accessed and saved. The Send File 2102 to the Student area is where files are uploaded and sent to specific students. The user can also delete files that are no longer needed.

Course Options

The Course Options area 1608 includes a Course Options link 1642 that will display a web page to the instructor that has the links for Button Availability, Tool Availability, Course Availability, Course Duration, Enrollment Options, Enrollment Fees, and Guest Access. Selection of the Button Availability link will display a web page that will allow the user to set and configure the buttons that are used by students in that course, including enabling or disabling them, or making them secure (i.e. only accessible by enrolled students). Selection of the Tool Availability link will display a web page that will allow the instructor to enable or disable the student tools and communication functions for that course (i.e. email, discussion board, virtual chat, student roster, group pages, student dropbox, edit homepage, personal information, calendar, grades, tasks, electric blackboard, student manual, and course search). Selection of the Course Availability link will display a web page that will allow the instructor to enable or disable the availability of the course to students (i.e. it can be kept unavailable until the course site is finished). Selection of the Course Duration link

will display a web page that will allow the instructor to select the duration of the course (continuous, start and end dates, or number of days from the date of enrollment). Selection of the Enrollment Options link will display a web page that will allow the instructor to select the enrollment options as either "instructor led", which allows students to email enrollment requests to the instructor, or "self-enrollment", which will specify the start and end dates and optionally require entry by the student of an access code to enroll. Selection of the Enrollment Fees link will display a web page that will allow the instructor to specify if fees should be charged for enrollment in the course, and what the fees should be. Selection of the Guest Access link will display a web page that will allow the instructor to specify if guests may access the course.

Selection of the Course Properties link 1644 in the Course Options area 1608 displays a web page that enables the instructor to add and/or edit course properties, including the course name, a description of the course, and a subject area for categorization purposes.

Selection of the Course Utilities link 1646 in the course options area 1608 displays a web page that enables the instructor to select a Course Recycler link, an Export Course Link, or an Import Course Cartridge link. The Course Recycler link enables the instructor to recycle the course by selectively removing areas of the course, which are displayed as check boxes next to various content categories (course

documents, course information, textbooks, assignments, etc.), various staff areas (staff information, faculty), and external web links. The instructor can also choose to recycle other areas such as discussion boards, gradebook, assessments, etc. The Export Course link enables the instructor to export all, or specific sections, of the course (i.e. content, users, assessments, and/or discussion boards). The Import Course Cartridge link enables the instructor to download and install a course cartridge (if they have an access key).

Selection of the Course Images link 1648 in the course options area displays a web page that enables the instructor to select a Button Style link (to set the button styles for the course) and to select a Course Banner link (to add or remove a course banner on the first page of the course).

Selection of the Academic Web Resource link 1650 in the course options area displays a web page that enables the instructor to select an Enable/Disable Academic Web Button link (to enable or disable the resources button the course homepage) or a Customize Academic Web Button link (to designate the Academic Resources for the course, wherein the instructor can customize the number of links and the content that is available for the students).

User Management

Selection of the Add Users link 1652 in the user management area 1610 displays a web page that enables the instructor to select a Create User link, an Enroll Existing User link, or a Batch Add User link. The Create User link

WO 01/01372

PCT/US00/17979

displays a web page that will enable the instructor to create a new user account and enroll him in the course, by inputting name, address, etc. of the user, designating the user's role (student, instructor, TA, grader, etc.) and providing a password if desired. The Enroll Existing User link displays a web page that enables the instructor to enroll a user in the course. The Batch Add Users link displays a web page that enables the instructor to create all of the user accounts by uploading a text file containing the user data.

Selection of the List/Modify Users link 1654 in the user management area 1610 displays a web page that enables the instructor to list and/or modify the users of the course, while selection of the Remove Users link 1656 displays a web page that enables the instructor to remove a user if desired from the course. Selection of the Manage Groups link 1658 enables the instructor to create and edit certain user groups (e.g. gifted students, remedial students, etc.).

Assessment

Within the course, instructors are able to bring quizzes, tests, and surveys online. Included may be essay, true/false, multiple choice, fill-in-the-blank, or matching questions. The questions can include text, graphics or multimedia. For the student, instant feedback is provided through automatic grading functionality. For the instructor, there is the ability to randomize the tests, time them, and create statistical reports of outcomes. Assessments within this system are an optimal way to

increase student preparedness for class and to track and compare student progress over time. The Assessment area 1612 of the control panel 1602 allows the instructor to select an Assessment Manager link 1660, a Pool Manager link 1662, an Online Gradebook link 1664, or a Course Statistics link 1666.

Selection of the Assessment Manager link 1660 in the assessment area 1612 displays a web page that enables the instructor to create, edit and otherwise manage the assessment content areas. For example, the instructor may create an assessment by entering an assessment name, a description, and setting certain parameters including Show Detailed Results (shows the students the results for each question instead of simply their final grade), Reveal Correct Answer (shows the students the correct answer for each question), Feedback Enabled (allows students to view the feedback that the instructor has entered for each question), Allow Multiple Attempts (allows students to take the assessment more than once), Set Time for Quiz (sets a timer that is shown to the student during the exam), and Password Protect (allows only those students with the entered password to take the test). By clicking the Modify option, a web page is displayed that enables the instructor to modify the assessment by adding items. An item is added by selecting the type of question (multiple choice, true/false, fill in the blank, etc.), typing in the question text and possible answers (i.e. if it is multiple choice) with an indication of the correct one, specify the order of answers, etc. The order of the questions can be changed in this web page as well.

Selection of the Pool Manager link 1662 in the assessment area 1612 displays a web page that enables the instructor to Add Pool, Import Pool, Search Pool, or Export Pool. Pools are predefined groups of questions and answer sets that are logically linked, usually by subject matter, so that an instructor may draw from a pool to obtain existing questions and answers sets from other courses, instructors, semesters, etc. and not have to "recreate the wheel" every time they generate or modify a test. Thus, by clicking the Add Pool button, the instructor can add a new pool to the list of pools displayed on the Pool Manager web page. He will have to type in the name of the new pool and a description of it on this form. By clicking the Import Pool button, the instructor will enter the name of an existing pool to import, or alternatively browse a disk drive to find the pool to import. By clicking the Search Pool button, the instructor is presented with a web page that will enumerate various available pools that can be searched for questions of interest for importing. The entire pool can be previewed by selecting a preview mode, and all of the available questions in that pool may be viewed. By clicking the Export Pool button, a pool may be selected for exporting purposes. For the list of available pools set forth on the Pool manager page, the instructor may modify the pool, in which case a web page is displayed that lists all of the questions (and associated answer sets) that are in the pool. Each question in the pool may be modified in the same manner as explained above with respect to the assessment manager. Likewise, questions may be deleted entirely from a pool, and new questions may be added to the pool as described above with respect to the assessment manager.

Selection of the Online Gradebook link 1664 in the assessment area displays a web page that enables the instructor to perform various functions with respect to the online course gradebook. Figure 22 illustrates a web page 2200 entitled "Course Gradebook", which provides a variety of information including consolidated grades, individual assignment/test scores, direct access to specific assignments or tests by student, or a look at a specific test with aggregated results. This allows the instructor to organize the grade information so that it is meaningful. It provides insight into the effectiveness of certain assignments and provides a bridge for allowing instructor-assessment of assignment and class content. The functions provided on the Online Gradebook web page in the assessment area of the control panel include Report By User (used to find a specific user and view statistics, assessment results, and modification of any scores for a user), Report By Item (used to view information about a specific gradebook item), Spreadsheet View (standard gradebook view as shown in Figure 22, the instructor can modify, add or remove gradebook entries as well as view assessment results), and Export Gradebook (exported as a comma-delimited file).

Selection of the Course Statistics link 1666 in the assessment area displays a web page that enables the instructor to set parameters and view certain statistics for their course. Most instructors want to analyze their class by how much their online materials are being accessed, but very few have the opportunity to take the time or the effort to determine these numbers. By using the course statistics web page 2300 shown in Figures 23A and 23B, the system

provides a rich tool set for instructors to evaluate the relative statistics of their courses. These statistics may be valuable for evaluating online versus non-online courses to determine the relative efficacy of online materials and how they are enhancing the course. Thus, the Course Statistics web page has input fields for selecting a report filter, which will yield a report with Overall Summary of Course Usage, Main Content Areas report, Communication Areas Report, Group Areas Report, or Student Areas Report. The time period must be specified, which may be all dates or between a beginning date and an end date. The users must be selected, which will be either all users or a selected subset thereof. Other options include Total Number of Access per Area 2302, Number of Accesses over Time 2304, User Accesses per Hour of Day 2306 (or Day of Week 2308), and Total Accesses by User 2310. The data, charts and graphs as shown in Figures 23A and 23B will then be displayed to the instructor.

Assistance

Finally, there is an Assistance area 1614 defined in the Control Panel, which sets forth links that will provide the instructor with various types of help. Selecting the Online Manual link 1668 will bring up an HTML based Instructor Manual in a separate browser window. The Online Support link 1670 will bring up a web page with contact info for sending an email to a support person, and the Contact Admin link 1672 will bring up a web page with contact info for sending an email to an administrative contact.

Administrator Functionality

The Administrator Panel 2402, shown in Figure 24, gives the system administrator complete access to all of the features of the system including portal features, course and club creation and management, institution and system tools, e-commerce features, user management, and other various institutional options. This is accessed by selecting the Enterprise Administration tab 2404 shown on the homepage.

The Administrator panel 2402 includes a Portal Areas group 2406 of functions, a System Tools area 2408, an Enterprise Tools Area 2410, a System Options Area 2412, a Course and Community Management area 2414, a User Management Area 2416, an E-Commerce Area 2418, and an Assistance area 2420, as explained further below.

Portal Areas

Selection of the My Institution tab 2422 in the Portal Area 2406 provides a web page that lists four hyperlink selectable options: Customize Institution Tab, Institutional Module Options, All Module Options, and Off-Campus Institution Partnerships. The Customize Institution Tab link will provide a web page that allows the user (the enterprise administrator, in this case) to enable/disable the appearance of the "My Institution" tab for all users, as well as enable/disable a Welcome Message that may be displayed at logon. The user may also select an image for the tab, as well as the name, and provide a predefined URL that will be associated with the tab when selected by the end user.

The Institutional Module Options refers to the default layout is the set of modules that new users sees the first time they log in to the portal. This allows the enterprise administrator to enable/disable and/or set as required the following modules: My Courses, My Organizations, Today's Announcements, Today's Tasks, Today's Calendar, School Services, Student Module, Faculty Module, Staff Module, Alumni Module, Perspective Student Module, Guest Module, Other Module, Institution Newspaper Module, and Blank Module (a blank module that can be customized).

The All Module Options link allows the user to enable/disable and/or set as required the following modules: Bookmark, Calculator, Channels, Clip, Comment Clip, Custom Search, Directory, Discussion Boards, various co-branded portal links (such as EXCITE news, entertainment features, stock prices, sports updates, maps, etc.), shopping site links, yellow pages links, etc.

The Off-Campus Institution Partnerships link allows the user to add, modify, and edit hyperlinks to web sites with which the institution has formed various partner or other types of arrangements; for example, a partnership with an off-campus bookstore may be provided as a means for supplementing the on campus bookstore.

Selection of the Course tab 2424 in the Portal Area provides a web page that lists four hyperlink selectable options: Customize Courses Tab, Enable/Disable Course Creation, Course Catalog Options, and Off-Campus Learning Partnerships. The Customize Courses Tab link will provide a web page that allows the user (the enterprise administrator,

in this case) to enable/disable the appearance of the
"Courses" tab for all users. The user may also select an
image for the tab, as well as the name, and provide a
predefined URL that will be associated with the tab when
5 selected by the end user.

Selection of the Enable/Disable Creation Option link
provides a web page that allows the enterprise administrator
to select an option to not allow users to create courses, to
10 allow users to create courses, or to allow the user to send
an email request for course creation. Selection of the
Course Catalog Options link provides a web page that allows
the enterprise administrator to select the use of a default
course catalog or to specify the use of an internal course
15 catalog and the URL of its location. The Off-Campus
Learning Partnerships link allows the user to add, modify,
and edit hyperlinks to web sites with which the institution
has formed various learning partner arrangements; for
example, a link to the KAPLAN or TUTORNET web sites.

20 Selection of the Community tab 2426 in the Portal Area
provides a web page that lists five hyperlink selectable
options: Customize Community Tab, Enable/Disable User
Creation of Organizations and Discussion Boards,
25 Organization Catalog Options, Manage Discussion Boards, and
Off-Campus Community Partnerships. The Customize Community
Tab link will provide a web page that allows the enterprise
administrator to enable/disable the appearance of the
"Community" tab for all users. The user may also select an
30 image for the tab, as well as the name, and provide a
predefined URL that will be associated with the tab when
selected by the end user.

Selection of the Enable/Disable User Creation of Organizations and Discussion Boards link provides a web page that allows the enterprise administrator to select options to allow or disallow instructors and students to generate general organizations and discussion boards from the Community Tab or limit organization/discussion board creation to the system administrator.

Selection of the Organization Catalog Options link provides a web page that allows the enterprise administrator to select the use of a default club catalog or to specify the use of an internal club catalog and the URL of its location. The Manage Discussion Board link provides a web page that allows the user to set various parameters and otherwise add and manage various discussion boards on the system. The Off-Campus Community Partnerships link allows the user to add, modify, and edit hyperlinks to web sites with which the institution has formed various arrangements.

Selection of the Services tab 2428 in the Portal Area provides a web page that lists three hyperlink selectable options: Customize Services Tab, Institution Services, and Off-Campus Service Partnerships. The Customize Services Tab link will provide a web page that allows the enterprise administrator to enable/disable the appearance of the "Services" tab for all users. The user may also select an image for the tab, as well as the name, and provide a predefined URL that will be associated with the tab when selected by the end user.

Selection of the Institution Services tab allows the

user to create and manage links to other relevant parts of the campus intranet. The Off-Campus Service Partnerships link allows the user to add, modify, and edit hyperlinks to web sites with which the institution has formed various service arrangements.

Under the System Tools area 2408 of the Portal Manager web page, various links are provided to web pages that allow the enterprise administrator to manage Announcements 2410, the Institution Calendar 2412, the Institution Tasks 2414, and Send E-Mail 2416 in a manner similar to what was described with respect to similar tabs in the previously described sections above.

Under the Enterprise Tools area 2410 of the Portal Manager, links are provided to web pages that allow the enterprise manager to Manage Institution Library 2418, and View Published Requests. The Manage Institution Library web page allows the user to add new items from local disk or his inbox into the institution library, edit items, remove items, etc. The View Published Requests web page allows users to view, approve and reject instructor published files for the Institution Library.

Under the System Option area 2412 of the Portal Manager, the user is provided with links to Gateway Options 2424, System Settings 2426, System Statistics 2428, Institution Properties 2430, Colors and Images 2432, and Course Marketing 2434. The Gateway Options link 2424 provides a web page that will determine whether the login button, course catalog, and new user account button appears on the gateway page. The System Settings link 2426 provides

a web page with links to Button Overrides (sets which button areas can be used throughout the system), Tool Overrides (sets which tools can be used throughout the system), System Settings/Overrides (set overrides for course and club tools and properties across the entire system), and Course Disk Quotas (sets file system disk quotas for courses).

The System Statistics link 2428 provides a web page with links to a System Reports web page (which allows the enterprise administrator to view reports covering the system and its usage), an Auto-Reporting Options web page (which sets various options for automatically reporting statistics to a service provider), and a Send System Statistics web page (which will send the statistics to the service provider on demand).

The Institution Properties tab 2430 provides a web page that allows the enterprise administrator to view system information such the current version of the software, the registration page, and email contacts. The Colors and Images link 2432 allows access to a web page that allows the administrator to modify the aesthetic properties of the web site.

The Course and Community Management area 2414 of the Portal Manager provides hyperlinks for Create Course 2436, Manage Courses 2438, Course Utilities 2440, Course Catalog 2442, Create Organization 2444, Manage Organization 2446, Organization Utilities 2448, and Organization Catalog 2450.

The Create Course web page 2900 is shown in Figure 29. There, the administrator will enter the requested

information about the desired course; i.e. the course name, and ID, and a textual description. The administrator can then specify properties of the buttons that will be used along with the course to match his aesthetic concerns. The administrator can then specify various options, such as the subject area of the course, whether guests may access the course, if the course is currently available, if a course cartridge may be obtained and its URL and access key, and the instructor ID for the course.

The Manage Courses web page allows the administrator to list and/or modify courses, remove them from the system, and set certain default tools (email, Discussion Board, Virtual Chat, Roster, etc.) and buttons (Announcements, Course Information, Staff Information, Virtual Classroom, etc.) to be used with each course in the system. The Course Utilities web page allows the administrator to select a Copy Course link (to make a copy of a course with a new course ID), an Import Course link, an Export Course link, and a Batch Create Courses link. The Course Catalog link allows the user to categorize course and otherwise manage the course catalog.

The Create Organization, Manage Organization, Organization Utilities, and Organization Catalog links allow the user to obtain similar control and functionality with organizations as with courses as described above.

The User Management area 2416 of the Portal Manager provides hyperlinks for Create User 2452, Manage Users 2454, and User Utilities 2456. The Create User web page 3000 (Figures 30A and 30B) allows creation of a user entry by

entering personal information such as name, address, etc., and a user name and password. The role of the user is set at this time, which may be a Student, Faculty, Staff, Alumni, Guest, etc. Also, the user may be given an administrative role at this point by selecting the appropriate option that is available (None, System Admin, System Support, Course Creator, Account Admin). The role of the user will determine the access and control of the system that the user will have as explained throughout this document. Once a user is created, the Manage User web page allows listing, modification, and/or removal of users. The User Utilities link 2456 allows the system administrator to Batch Create Users (upload a file of user data in predefined formats compatible with the system), Batch Enroll Users (import a file to enroll users in courses and clubs that exist in the system), and Batch Remove Users (import a file to remove users from the system).

The E-Commerce area 2418 of the Portal Manager provides links to web pages for Sponsorships 2458, Partnership Program 2460, and Course E-Commerce 2462. The Sponsorship web page has links to Primary Site Sponsor web page a "My Institution" Area Sponsor, a Course Area Sponsor, a Community Area Sponsor, and a Services Area Sponsor. These links allow the user to designate if a sponsor is used in each of these capacities, an image of the sponsor link, etc.). The Partnership program page allows the administrator to enroll the institution in the service provider partnership program, which can bring additional e-commerce opportunities to the portal environment. The Course E-Commerce page provides links to Enable/Disable Course and Club E-Commerce (to select e-commerce options for charging

fees for the courses or clubs, allow administrators to set prices, allow club leaders or instructors to set prices, etc.), and a Price Course link to manage or set the cost of enrolling in courses or organizations.

5

Other Utilities and Functions

One of the key elements to college and university life is the ability to socialize and take advantage of the human element on campus. The system's "Community" tab 2502 provides the web page 2500 shown in Figure 25, which allows students to interact and be involved in all aspects of campus life from fraternities and sororities to off-campus communities that enhance the learning experience. Many campuses also provide rich services such as job availability through the community function. The Community center is the web equivalent of the student union building.

Most students are so conversant in online services that they prefer to have campus administrative services available all the time on the web. The system provides an enterprise level teaching and learning system that allows tight integration into student information systems and other campus systems to provide anytime, anywhere administrative services. The Services web page 2600 shown in Figure 26 (selected by tab 2602) enables users to register, add, drop, check records, or even pay parking tickets while online at anytime.

The system also provides a calendar 2700 that incorporates personal as well as institutional information in a single view, as shown in Figure 27. The calendar

utility gives students and teachers access to all calendar events for each of the courses they are enrolled in, as well as institutional calendar events.

5 Since email is the single most popular application on the Internet today, and the leading reason that most people purchase personal computers, email has been integrated with the system, as shown by the web page 2800 in Figure 28. Within a personalized home page, the user will be able to
10 access complete email capabilities. The email system sits on top of the existing POP or IMAP server and offers a web-based front end so that the user may access messages from any machine at any time.

15 Figures 31 and 32 show web pages 3100 and 3200 that can be accessed by tab 3102 to provide links that allow students and teachers to find and access academic resources and content. These resources are also context-sensitive to the course discipline. For example, if one accesses the
20 academic web resources from an accounting course, he is automatically directed to news and information sources that are relevant to accounting. The user has access to news, web links, reference works, and search engines that enhance the ability to locate relevant information quickly.

25 In another aspect of the invention, provided is a system and method for applying E-commerce to education. Specifically, this aspect of the invention allows users visiting a web site to register and pay for courses provided
30 by a college, university, or other institution.

Figure 34 is a block diagram illustrating information

passed from a course registration server to a payment
server. As a current or prospective student reviews courses
offered by a college, university, or other institution, a
student may add courses of interest to a list, or "shopping
5 cart".

When a student has selected courses for which they
would like to register, a student may proceed from a
registration or review area (Block 100) to a "checkout" area
10 (Block 110), as illustrated in Figure 34. When a student
proceeds to a checkout, information, such as, but not
limited to, name, address, cost of courses, order
identifier, order description, and a page to which a user is
to be returned when an order is complete, is passed on.
15 Information passed from a registration or review area may be
used to generate a payment form.

Figure 35 is a sample of a payment form. A payment
form may consist of an introductory paragraph 210, a
20 purchase summary 220, a payment information area 230, and
the like. An introductory paragraph 210 may be used to
instruct a student in requirements at each stage of the
payment process. A purchase summary 220 may include
services and products selected, per-unit prices, quantities
25 requested, inventory numbers for each product or service
selected, an invoice or purchase number, a total price, and
other, similar information.

A payment information area 230 can be used to collect
30 payment information from a student. A student may be
required to enter some information manually, such as, but
not limited to, credit card type, credit card number, credit

card expiration date, name on credit card, credit card
billing address, check number, checking account number, bank
routing number, debit card number, and personal
identification number ("PIN code").

5

If a student has previously used the present invention,
some information may be automatically entered based on
previously submitted forms. Information transferred from a
registration server may also be used to fill in some form
10 fields. When a student has reviewed entered information, a
form may be submitted for processing by activating a button
or other interface element.

Figure 36 is a block diagram illustrating interaction
15 between a payment server and a payment validation server.
After a student has entered necessary information into a
payment form and submitted the form (Block 300), some
information, such as, but not limited to, amount of
purchase, credit card number, name on credit card, check
20 number, bank routing number, or billing address, may be
transmitted to a payment validation server (Block 310). A
payment validation server may be maintained as part of the
present invention, or payment validation servers may be
maintained by one or more third parties, such as, but not
25 limited to, CyberCash, Inc.

A payment validation server processes transmitted
information, contacts a bank or other institution issuing
the credit card or other payment form, and verifies that a
30 payment of the amount requested is authorized. If payment
of the requested amount is authorized, authorization
information, including, but not limited to, a confirmation

number, may be transmitted to a payment server.

If payment of the specified amount is not authorized, other information, such as a declination code, may be transmitted to a payment server. If payment is not authorized, a
5 payment error message similar to Block 320 may be displayed. Figure 37 is a sample of a payment information page. A student may print or otherwise record information displayed on a payment information page for his or her records.

A payment information page can include a thank you,
10 confirmation, or other message (Block 410). A payment information page may also include information such as, but not limited to, confirmation or declination information; goods, services, and classes purchased; and total price charged (Block 420). In addition, a payment information
15 page may include a button or other interface element which a user can activate to continue processing. The exact behavior of this interface element may be determined by the referring system through the URL or other data element which is illustrated in Figure 34.

20 Figure 38 is a block diagram illustrating post-order processing. As previously stated, a payment information page may also contain a button or other interface element which, when activated, causes a web page to be displayed or
25 performs other processing steps. Activating the button or interface element may also cause some authorization/declination information to be transferred to a college, university, or other institution's accounting department for processing (Block 530).

30 Open Web Environment

The present invention may be used as an open platform environment, where anyone with access to the Internet may register as an instructor to create, administer, and make available a course to anyone else with Internet access.

5 Thus, by entering a publicly available website such as www.blackboard.com, a user may register as an instructor and be provided with an instructor control panel for creating course as described herein. To create the course, the user will define course parameters such as a description,
10 enrollment options, announcements, assessments, course materials, etc., and provide them in the various web pages as described above. The user can then let others know about the availability of the course online, and a potential student may access the publicly available web site to enroll
15 in the course. In this manner, anyone can create a virtual classroom without the need to be affiliated with an institution, and disseminate knowledge through the course as previously unavailable.

20 While the preferred embodiment and various alternative embodiments of the invention have been disclosed and described in detail herein, it may be apparent to those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and
25 scope thereof. In addition, titles and descriptions included in the Figures are included to disclose the best mode contemplated by the inventor at the time of filing, and should not be construed as limiting the invention.

WE CLAIM:

1. A system for providing to a community of users access to a plurality of online courses comprising:

5 a) a plurality of user computers, each user computer associated with a user of the system having predefined characteristics indicative of a predetermined role in the system, each role providing a level of access to a plurality of data
10 files associated with a course and a level of control over data files associated with a course, and

b) a server computer in communication with each of the user computers over a network, the server computer
15 comprising

means for storing a plurality of data files associated with a course;

means for assigning a level of access to each file, the level of access associated with the
20 ability of a user to access the file;

means for determining an access level of a user requesting access to a file;

means for allowing access to a file associated with a course as a function of the
25 access level of the user.

2. The system of claim 1 wherein the user roles comprise a student role associated with a student user, an instructor role associated with an instructor user, and
30 an administrator role associated with an administrator user.

3. The system of claim 2 wherein the instructor user is provided with an access level to enable the creation and editing of a plurality of files associated with a course.

5

4. The system of claim 3 wherein the course files comprise an announcement file.

5. The system of claim 3 wherein the course files comprise a course information file.

10

6. The system of claim 3 wherein the course files comprise a staff information file.

7. The system of claim 3 wherein the course files comprise a course documents file.

15

8. The system of claim 3 wherein the course files comprise an assignments file.

20

9. The system of claim 3 wherein the course files comprise a dropbox file.

10. The system of claim 3 wherein the course files comprise an asynchronous communication file.

25

11. The system of claim 3 wherein the course files comprise a synchronous communication file.

12. The system of claim 3 wherein the student user is provided with an access level to enable reading of a plurality of files associated with a course.

30

13. The system of claim 12 wherein the student user is provided with an access level to enable modification of a subset of the plurality of files associated with a course.

14. The system of claim 12 wherein the user is provided with an access level to enable creation of a student file associated with a file for which the student user is able to read.

15. The system of claim 14 in which the file that the student is able to read is an assessment file created by the instructor user, and the student file created by the student user is a response to the assessment file.

16. The system of claim 15 wherein the assessment file is comprises a plurality of examination questions selected by the instructor user to assess the ability of the student user.

17. The system of claim 16 wherein the examination questions are selected by the instructor user from a predetermined pool of available examination questions.

18. The system of claim 16 wherein the examination questions are created by the instructor user substantially at the time of the creation of the assessment file.

19. The system of claim 16 wherein the student file is reviewed by the instructor user and assigned a grade.
- 5 20. The system of claim 19 wherein the grade is made available to the student user.
21. The system of claim 19 wherein the instructor user collates a plurality of grades obtained from
10 reviewing a plurality of student files, and wherein the collated grades are made available to all student users associated with the course.
22. The system of claim 14 in which the file that the
15 student is able to read is an assignment file created by the instructor user, and the student file created by the student user is a response to the assignment file.
- 20 23. The system of claim 9 wherein the dropbox file comprises a plurality of files transferred to the server computer from one or more student users associated with the course.
- 25 24. The system of claim 23 wherein the instructor user is provided with access to the files in the dropbox file, whereby the instructor user may download, edit and upload the files in the dropbox.
- 30 25. The system of claim 1 wherein a user is required to enter a login sequence into a user computer in order to be provided with access to course files

associated with that user.

26. The system of claim 25 wherein the user is provided with access to all courses with which the user is associated after entry of the logon sequence.

27. The system of claim 26 wherein the user is provided with a web page comprising a plurality of course hyperlinks, each of said course hyperlinks associated with each course that the user has enrolled in.

28. The system of claim 27 wherein selection of a course hyperlink will provide the user with a web page associated with the selected course, the web page comprising a plurality of content hyperlinks to various content areas associated with the course.

29. The system of claim 28 wherein said content hyperlinks comprise an announcement area hyperlink, a course information hyperlink, a staff information hyperlink, a course documents hyperlink, an assignments hyperlink, a communications hyperlink, and a student tools hyperlink.

30. The system of claim 29 wherein selection of the announcement area hyperlink provides a web page comprising a group of course announcements.

31. The system of claim 29 wherein selection of the course information hyperlink provides a web page comprising information regarding the associated

course.

32. The system of claim 29 wherein selection of the
staff information hyperlink provides a web page
comprising data regarding the instructors of the
associated course.

33. The system of claim 29 wherein selection of the
course documents hyperlink provides a web page
comprising a listing of documents associated with
the course.

34. The system of claim 33 wherein the listing of course
documents comprise active hyperlinks to the
documents.

35. The system of claim 29 wherein selection of the
assignments hyperlink provides a web page comprising
a group of course assignments.

36. The system of claim 29 wherein selection of the
communications hyperlink provides a web page
comprising hyperlinks to a group of communication
tools comprising an asynchronous communication tool
and a synchronous communication tool.

37. A system for providing to a community of users
access to a plurality of online courses, comprising
a server computer in communication with each of a
plurality of user computers over a network, the
server computer comprising means for creating a
plurality of course user accounts from a file of

existing user accounts associated with an external computer.

38. A method for providing online education comprising

a. establishing a course to be offered online,
comprising the steps of:

- i. an instructor user generating a set of course files for use with teaching the course;
- ii. transferring the course files to a server computer for storage thereat; and
- iii. making access to the course files available to a predefined community of student users having access to the server computer over a network;

b. offering the course to be taken online to a group of student users; and
c. providing access over the network to the course files to a student user who has enrolled in the course.

39. The method of claim 38 wherein at least one of the course files comprises a course assignment, further comprising the steps of:

- d) the student user creating a student file in response to the course assignment; and
- e) the student user transferring the student file to the server computer.

40. The method of claim 39 further comprising the steps of:

- f) the instructor user accessing the student file from the server computer;

- g) the instructor user reviewing the student file to determine compliance with the course assignment; and
- h) the instructor user assigning a grade to the student file as a function of the determination of compliance with the course assignment.

41. The method of claim 40 further comprising the step of the instructor user posting the grade to a file on the server computer accessible only to the student user with which the grade is associated.

42. The method of claim 40 further comprising the steps of the instructor repeating the steps (f), (g) and (h) for a plurality of student users that are enrolled in the course.

43. The method of claim 42 further comprising the step of the instructor user performing a statistical analysis on the grades assigned to the plurality of student users.

44. The method of claim 43 further comprising the step of making results of the statistical analysis available to the student users enrolled in the course.

45. The method of claim 38 further comprising the step of providing an asynchronous communication tool accessible to student users enrolled in the course for enabling asynchronous communication amongst the student users.

46. The method of claim 38 further comprising the step of providing a synchronous communication tool accessible to student users enrolled in the course for enabling

WO 01/01372

PCT/US00/17979

synchronous communication amongst the student users.

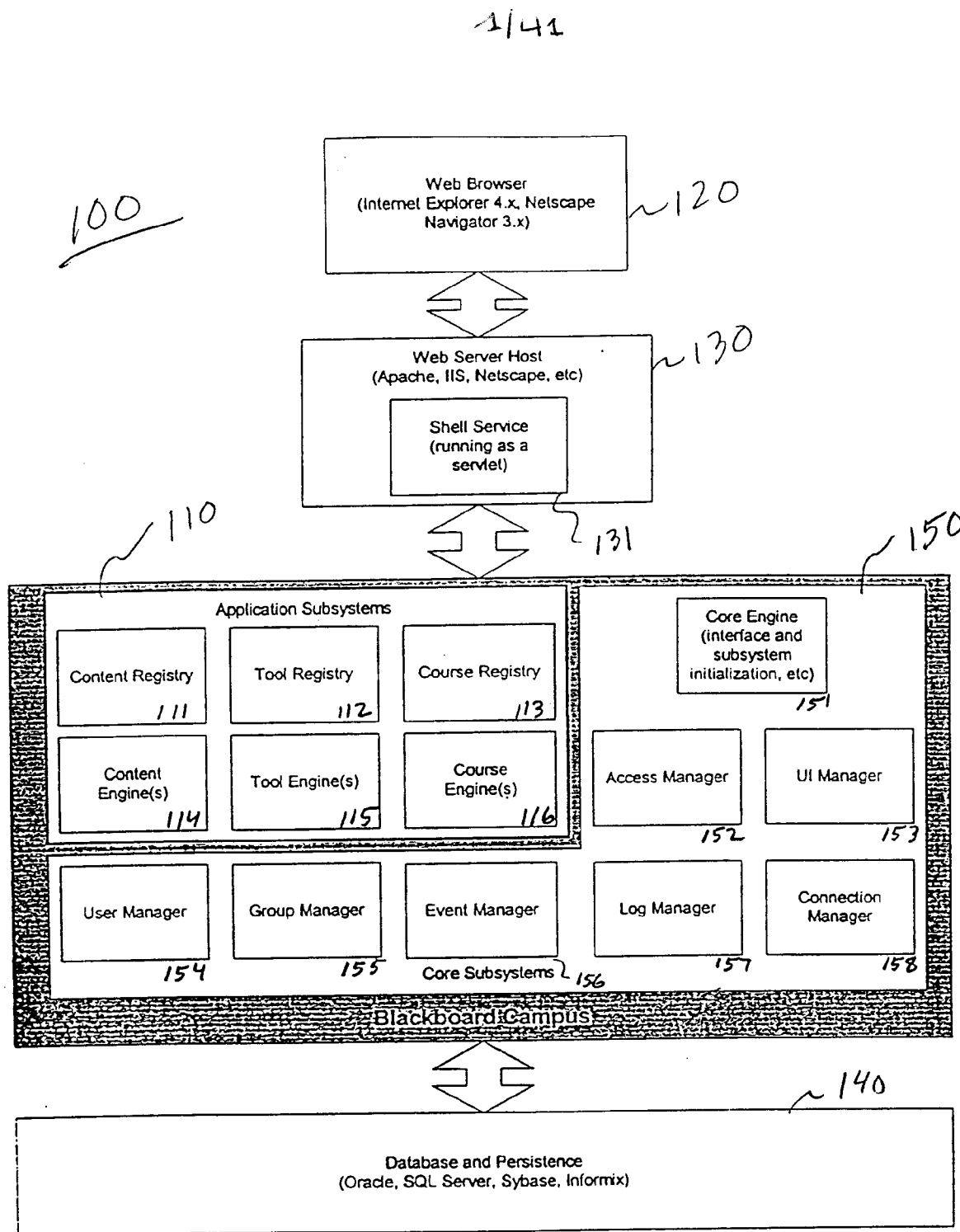


FIGURE 1

2/41

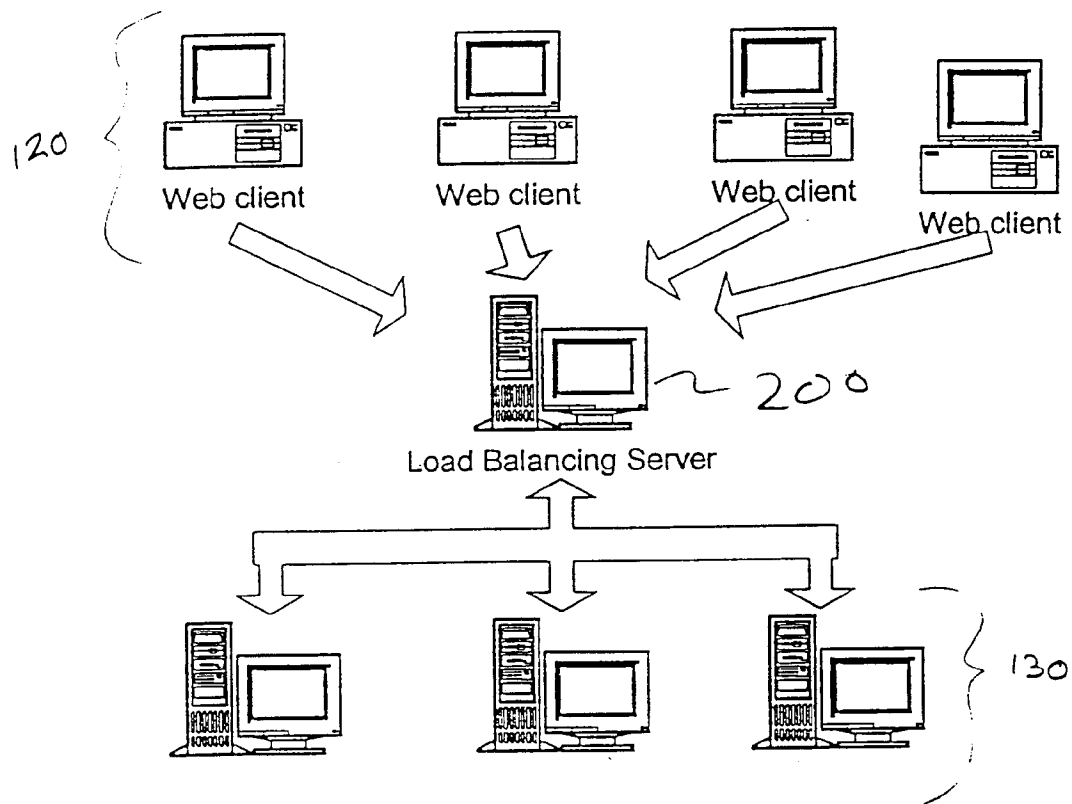


Figure 2 — Machine Scalability Using Load Balancing

3/41

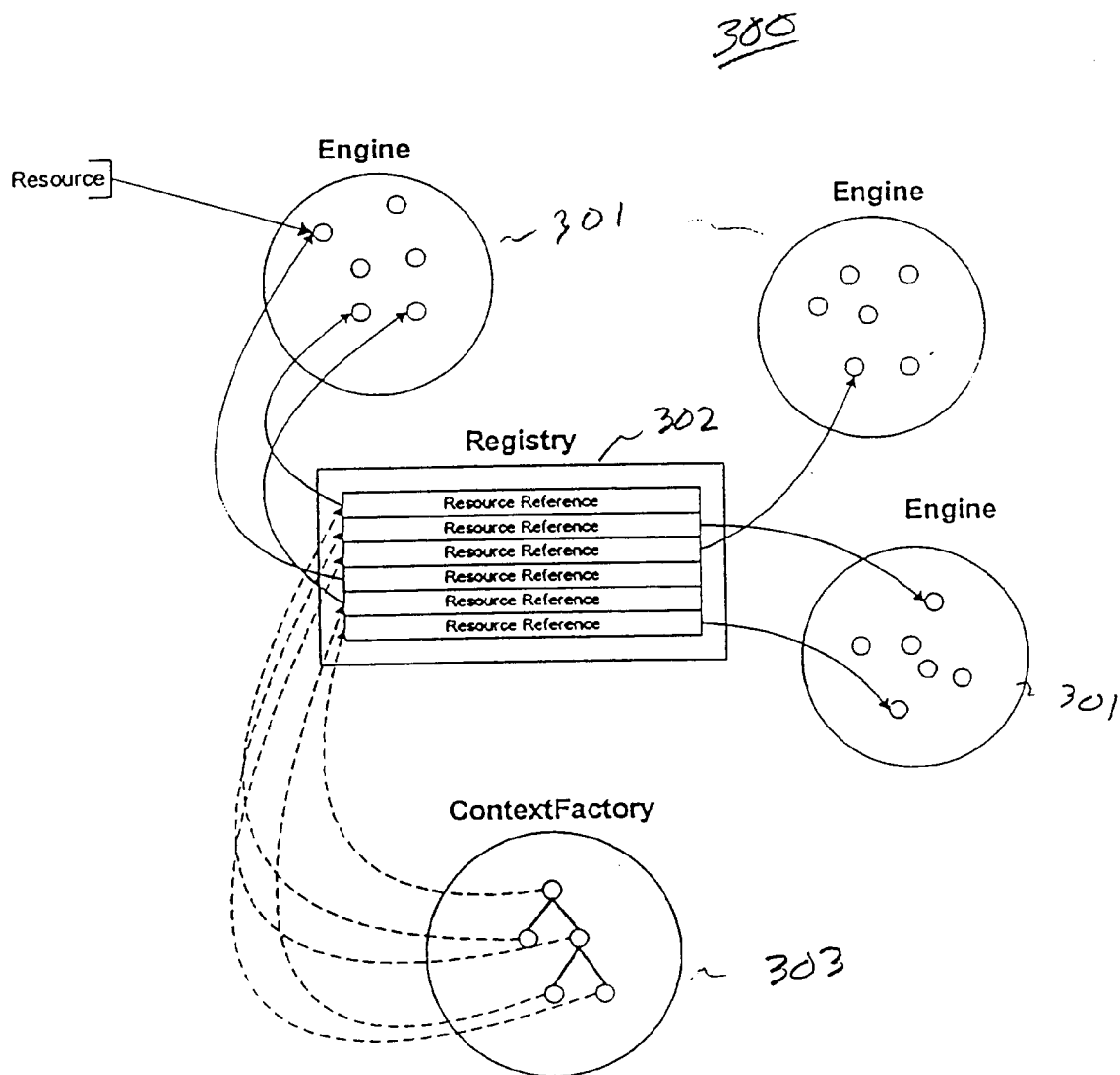


Figure 3 -- Engine/Registry Model

4/41

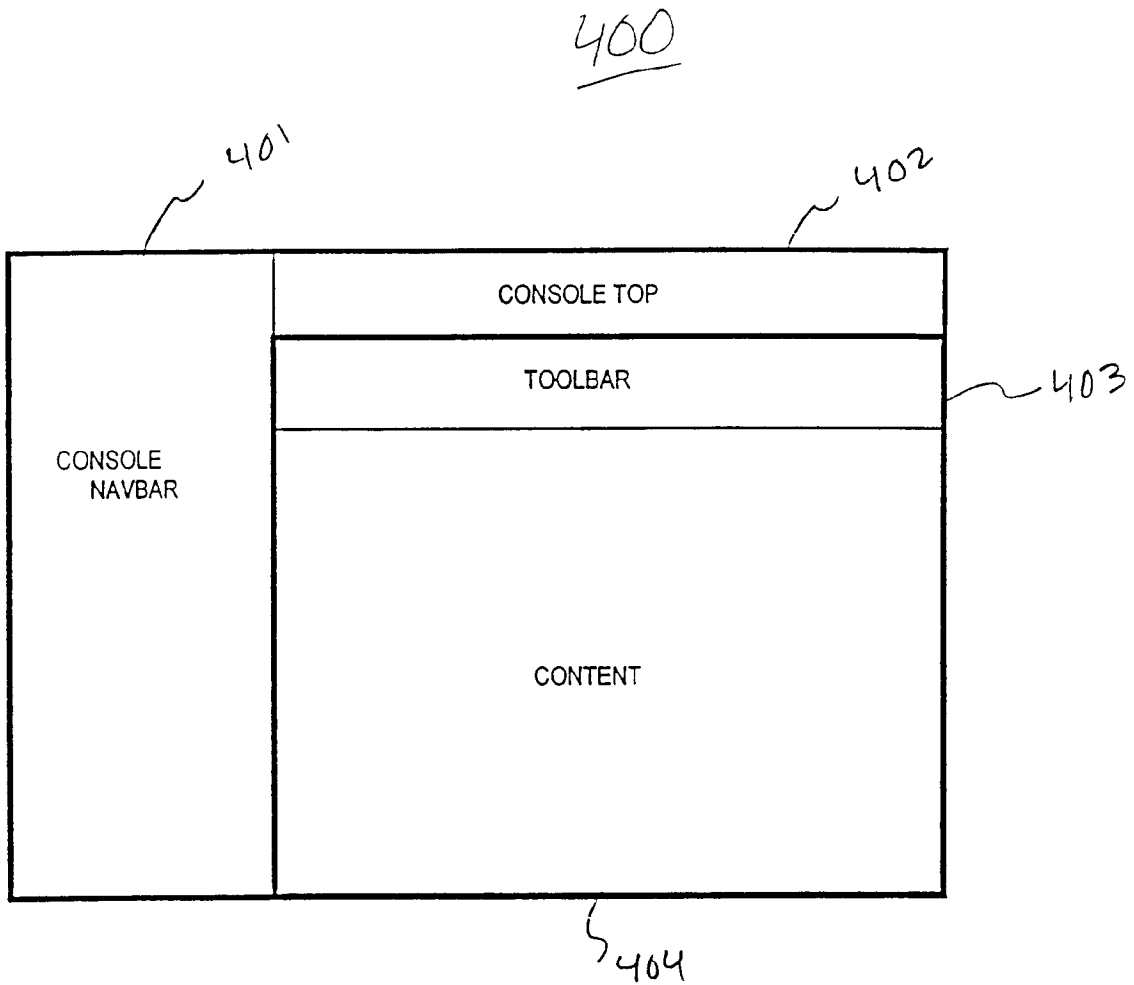


FIGURE 4

5/41

504

502

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://georgetown/Blackout_v30r/bb_admin/frames/frame_enterprise_myblackboard.html Go

Your Institution UNIVERSITY

My institution Courses Community Services Academic Web Resources

TOOLS

- Home
- e-Mail
- Announcements
- Calendar
- Tasks
- User Directory
- Address Book
- Course Grades
- Personal Info

SEARCH THE WEB

Search the Web:

[advanced search](#)

Welcome, Daniel! [Personalize](#) [Content](#) [Layout](#)

Today's Announcements [Edit](#) [X](#)

- Introduction to Music
- Mid-term exam tomorrow!
- Intro to Space
- Shuttle launch tonight at 6 pm EST.

[more.....](#)

Excite Business News [Edit](#) [X](#)

Business News

- BQJ: Too Soon to Be Sure on Recovery
- U.S. Consumers Boost Purchases for Y2K
- Millennium Bug in Hiding, So Far

Today's Tasks [Edit](#) [X](#)

Personal Tasks


- Order new computer Not Started
- Intramural soccer match Not Started

Introduction to Music

- Complete Assignment #4 in Progress

[more...](#)

Horoscopes [Edit](#) [X](#)

 **CAPRICORN**

Unexpected people find one another at

My Courses [Edit](#) [X](#)

Courses you are teaching:

- ☒ Introduction to Music
- ☒ Art History
- ☒ Intro to Space

Courses in which you are enrolled:

- ☒ Biology 101

[more...](#)

Today's Calendar [Edit](#) [X](#)

9:10am - 10:15am

Introduction to Music: Lecture #3
Warren B45 - remember to bring your instrument

10:30am - 11:45am

Art History: Field trip
Today we are visiting the MOMA [more...](#)

Weather [Edit](#) [X](#)

Washington, District of Columbia 51 (F) ☀️
sunny

Bethel, Alaska -25 (F) ☁️
sunny

Local intranet

520

Fig 5

6/41

Courseinfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://georgetown1/blackout_v30r/bb_admin/frames/frame_enterprise_courses.html

Your Institution UNIVERSITY

My Institution Courses Community Services Academic Web Resources

COURSE SEARCH

Search for a course:

[advanced search](#)

OFF-CAMPUS LEARNING

Kaplan
Help prepare for final exams.

TutorNet!
Need a tutor, use the virtual chat 24 hour TutorNet service.

eHow
Find out how to do just about anything.

Blackboard.com
Find courses you can take online.

SEARCH THE WEB

Search the Web:

[advanced search](#)

Course List:

Courses you are teaching:

Introduction to Music
Course ID: MUSIC101
Department: Art & Music
Instructor(s): Dr. Lou Pugliese
Online Material: Yes

American History
Course ID: AHIST101
Department: Social Science
Instructor(s): Dr. Chasen
Online Material: Yes

Courses in which you are enrolled:

Accounting 101
Course ID: ACCT101
Section: 2
Department: Business
Instructor(s): Alan Stewart
Online Material: No

Space and Beyond
Course ID: SPACE301
Section: 1
Department: Music
Instructor(s): Laurie Wagnon
Online Material: Yes

Algebra 2
Course ID: ALGEBRA2
Section: 2

Course Catalog:

- Agricultural Sciences & Natural Resources
- Architecture
- Arts & Sciences
- Business Administration
- Division of Continuing Studies
- Engineering & Technology
- Fine & Performing Arts
- Graduate Studies
- Great Plains Veterinary Educational Center
- Human Resources & Family Sciences
- Journalism & Mass Communications
- Law
- Military & Naval Sciences
- Nebraska College of Technical Agriculture - Curtis
- Public Affairs & Community Service
- Special Projects
- Teachers College

[Browse Course Catalog](#)

Local internet

600

Fig 6

7/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://georgetown1/Blackout_v30i/bb_admin/frames/frame_enterprise_courses.html

Your Institution UNIVERSITY Home Help Logout

My Institution Courses Community Services Academic Web Resources

COURSES > INTRODUCTION TO MUSIC

MUSIC101: Introduction to Music

Announcements

Course Information

Staff Information

Course Documents

Assignments

Communication

External Links

Student Tools

Resources

Course Map

Control Panel

Introduction to Music

music 101

Music Theory Basics
Music Notation
Acoustic Instruments
Music History

Announcements
Posted in the Last Two Weeks

Subject: Course Packets Posted by Rachel

The library has printed an additional 25 course packets. If you have up, please drop by the library and purchase one. They are available!

Subject: Assignment #3 Office Hours Posted by Rachel

Assignment #3 Office Hours have been changed from 2:00-3:00 to 3 B45

Today Last 2 Weeks Last Month All

Course Contents

(click on any box to expand)

- Course Information
- Course Information
- Staff Information
- Staff Information
- Course Documents
- Course Documents
- Assignments
- Assignments
- Communication
- Communication
- External Links
- External Links
- Student Tools
- Student Tools

Done

Fig 7

8/42

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Greenberg Training

File Edit View Favorites Tools Help

Back Search Favorites History

Address http://blackout.blackboard.com/course/instructor/index.htm

Your Institution UNIVERSITY

Home Help Logout

My Institution Course Community Services Academic Web Resources Enterprise Admin

John Wayne

Music101: Introduction to Music

Announcements

Course Information

Staff Information

Course Documents

Assignments

Communication

External Links

Student Tools

Resources

Course Map

My Blackboard

Search Logout

Subject: Class location change

We've moved to room 101

Posted by Rita McPhaul on May 19, 2000

Subject: Greeting

Welcome MCCD

Posted by Jonathan Goldstein on May 18, 2000

Subject: A new quiz has been posted.

To begin taking the quiz titled NYCTA [click here](#).

Please answer these questions carefully.

Posted by Rita McPhaul on May 10, 2000

Done

Start poANYWHERE... Inbox - Micro... Exploring - Des... Test on BB 5.d... CourseInfo... Fig Q.doc - Mic... Document20... Document21... Fig P.doc - Mic... Fig U.doc - Mic... Course Content...

Internet 3:37 PM

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Greenberg Training

File Edit View Favorites Tools Help

Back Search Favorites History

Address http://blackout.blackboard.com/course/instructor/index.htm

Your Institution UNIVERSITY

Home Help Logout

My Institution Course Community Services Academic Web Resources Enterprise Admin

Please check your announcements on a daily basis.

Thanks, Stacy

Subject: Course Map

Welcome to your new course

You can navigate your course by using the map below.

Course Contents

(click on any book to expand)

- Course Information
- Staff Information
- Course Documents
- Assignments
- Communication
- External Links
- Student Tools

Subject:

WELCOME TO MUSIC 101!

Use the buttons provided on the left side of your screen to navigate the CourseSite. Begin by clicking the COURSE INFORMATION button to view important information before beginning the course.

Today Last 2 Weeks Last Month All Show

Internet 3:38 PM

Start poANYWHERE... Inbox - Micro... Exploring - D... Test on BB... CourseInfo... Fig Q.doc - Mic... Document2... Document2... Fig P.doc - Mic... Fig U.doc - Mic... Course Cont... Fig C.doc - Mic... Document2...

FIG. 8

WO 01/01372

PCT/US00/17979

9/41

900

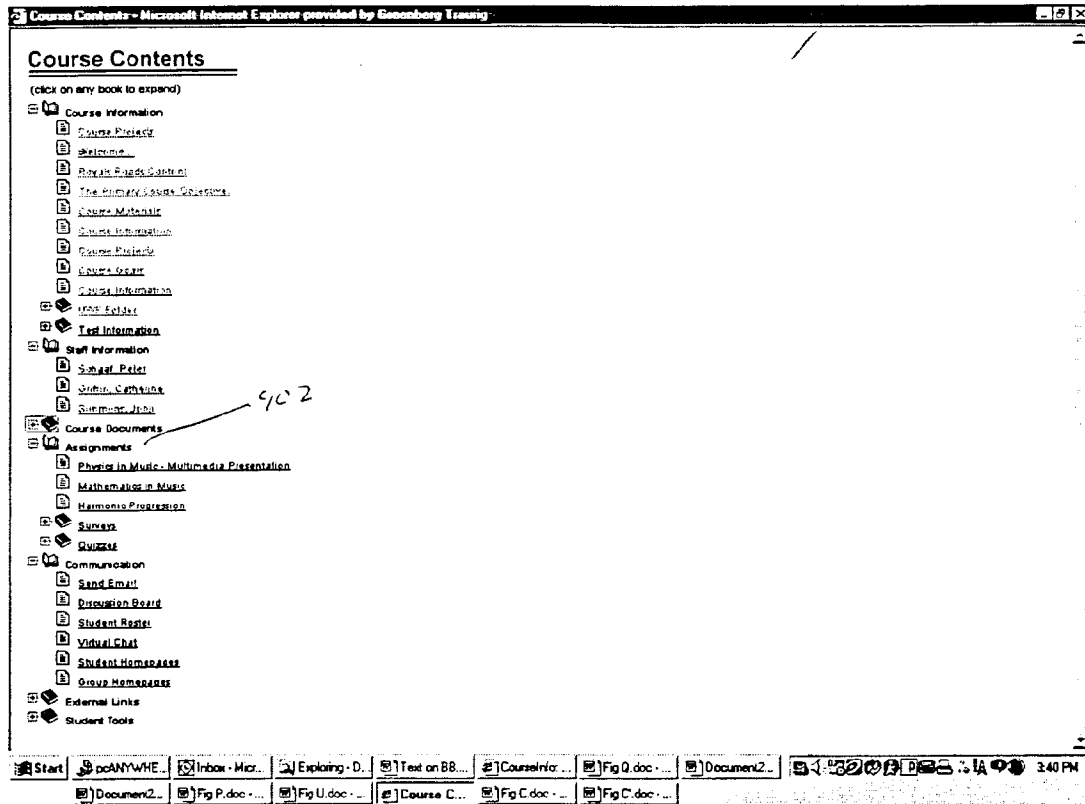


FIG. 9

10/42

1004

1006

1008

1010

1012

1014

1016

1018

1020

1022

1024

1026

1028

1030

1032

1034

1036

1038

1040

1042

1044

1046

1048

1050

1052

1054

1056

1058

1060

1062

1064

1066

1068

1070

1072

1074

1076

1078

1080

1082

1084

1086

1088

1090

1092

1094

1096

1098

1100

1102

1104

1106

1108

1110

1112

1114

1116

1118

1120

1122

1124

1126

1128

1130

1132

1134

1136

1138

1140

1142

1144

1146

1148

1150

1152

1154

1156

1158

1160

1162

1164

1166

1168

1170

1172

1174

1176

1178

1180

1182

1184

1186

1188

1190

1192

1194

1196

1198

1200

1202

1204

1206

1208

1210

1212

1214

1216

1218

1220

1222

1224

1226

1228

1230

1232

1234

1236

1238

1240

1242

1244

1246

1248

1250

1252

1254

1256

1258

1260

1262

1264

1266

1268

1270

1272

1274

1276

1278

1280

1282

1284

1286

1288

1290

1292

1294

1296

1298

1300

1302

1304

1306

1308

1310

1312

1314

1316

1318

1320

1322

1324

1326

1328

1330

1332

1334

1336

1338

1340

1342

1344

1346

1348

1350

1352

1354

1356

1358

1360

1362

1364

1366

1368

1370

1372

1374

1376

1378

1380

1382

1384

1386

1388

1390

1392

1394

1396

1398

1400

1402

1404

1406

1408

1410

1412

1414

1416

1418

1420

1422

1424

1426

1428

1430

1432

1434

1436

1438

1440

1442

1444

1446

1448

1450

1452

1454

1456

1458

1460

1462

1464

1466

1468

1470

1472

1474

1476

1478

1480

1482

1484

1486

1488

1490

1492

1494

1496

1498

1500

1502

1504

1506

1508

1510

1512

1514

1516

1518

1520

1522

1524

1526

1528

1530

1532

1534

1536

1538

1540

1542

1544

1546

1548

1550

1552

1554

1556

1558

1560

1562

1564

1566

1568

1570

1572

1574

1576

1578

1580

1582

1584

1586

1588

1590

1592

1594

1596

1598

1600

1602

1604

1606

1608

1610

1612

1614

1616

1618

1620

1622

1624

1626

1628

1630

1632

1634

1636

1638

1640

1642

1644

1646

1648

1650

1652

1654

1656

1658

1660

1662

1664

1666

1668

1670

1672

1674

1676

1678

1680

1682

1684

1686

1688

1690

1692

1694

1696

1698

1700

1702

1704

1706

1708

1710

1712

1714

1716

1718

1720

1722

1724

1726

1728

1730

1732

1734

1736

1738

1740

1742

1744

1746

1748

1750

1752

1754

1756

1758

1760

1762

1764

1766

1768

1770

1772

1774

1776

1778

1780

1782

1784

1786

1788

1790

1792

1794

1796

1798

1800

1802

1804

1806

1808

1810

1812

1814

1816

1818

1820

1822

1824

1826

1828

1830

1832

1834

1836

1838

1840

1842

1844

1846

1848

1850

1852

1854

1856

1858

1860

1862

1864

1866

1868

1870

1872

1874

1876

1878

1880

1882

1884

1886

1888

1890

1892

1894

1896

1898

1900

1902

1904

1906

1908

1910

1912

1914

1916

1918

1920

1922

1924

1926

1928

1930

1932

1934

1936

1938

1940

1942

1944

1946

1948

1950

1952

1954

1956

1958

1960

1962

1964

1966

1968

1970

1972

1974

1976

1978

1980

1982

1984

1986

1988

1990

1992

1994

1996

1998

2000

2002

2004

2006

2008

2010

2012

2014

2016

2018

2020

2022

2024

2026

2028

2030

2032

2034

2036

2038

2040

2042

2044

2046

2048

2050

2052

2054

2056

2058

2060

2062

2064

2066

2068

2070

2072

2074

2076

2078

2080

2082

2084

2086

2088

2090

2092

2094

2096

2098

2100

2102

2104

2106

2108

2110

2112

2114

2116

2118

2120

2122

2124

2126

2128

2130

2132

2134

2136

2138

2140

2142

2144

2146

2148

2150

2152

2154

2156

2158

2160

2162

2164

2166

2168

2170

2172

2174

2176

2178

2180

2182

2184

2186

2188

2190

2192

2194

2196

2198

2200

2202

2204

2206

2208

2210

2212

2214

2216

2218

2220

2222

2224

2226

2228

2230

2232

2234

2236

2238

2240

2242

2244

2246

2248

2250

2252

2254

2256

2258

2260

2262

2264

2266

2268

2270

2272

2274

2276

2278

2280

2282

2284

2286

2288

2290

2292

2294

2296

2298

2300

2302

2304

2306

2308

2310

2312

2314

2316

2318

2320

2322

2324

2326

2328

2330

2332

2334

2336

2338

2340

2342

2344

2346

2348

2350

2352

2354

2356

2358

2360

2362

2364

2366

2368

2370

2372

2374

2376

2378

2380

2382

2384

2386

2388

2390

2392

2394

2396

2398

2400

2402

2404

2406

2408

2410

2412

2414

2416

2418

2420

2422

2424

2426

2428

2430

2432

2434

2436

2438

2440

2442

2444

2446

2448

2450

2452

2454

2456

2458

2460

2462

2464

2466

2468

2470

2472

2474

2476

2478

2480

2482

2484

2486

2488

2490

2492

2494

2496

2498

2500

2502

2504

2506

2508

2510

2512

2514

2516

2518

2520

2522

2524

2526

2528

2530

2532

2534

2536

2538

2540

2542

2544

2546

2548

2550

2552

2554

2556

2558

2560

2562

2564

2566

2568

2570

2572

2574

2576

2578

2580

2582

2584

2586

2588

2590

2592

2594

2596

2598

2600

2602

2604

2606

2608

2610

2612

2614

2616

2618

2620

2622

2624

2626

2628

2630

2632

2634

2636

2638

2640

2642

2644

2646

2648

2650

2652

2654

2656

2658

2660

2662

2664

2666

2668

2670

2672

2674

2676

2678

2680

2682

2684

2686

2688

2690

2692

2694

2696

2698

2700

2702

2704

2706

2708

2710

2712

2714

2716

2718

2720

2722

2724

2726

2728

2730

2732

2734

2736

2738

2740

2742

2744

2746

2748

2750

2752

2754

2756

2758

2760

2762

2764

2766

2768

2770

2772

2774

2776

2778

2780

2782

2784

2786

2788

2790

2792

2794

2796

2798

2800

2802

2804

2806

2808

2810

2812

2814

2816

2818

2820

2822

2824

2826

2828

2830

2832

2834

2836

2838

2840

2842

2844

2846

2848

2850

2852

2854

2856

2858

2860

2862

2864

2866

2868

2870

2872

2874

2876

2878

2880

2882

2884

2886

2888

2890

2892

2894

2896

2898

2900

2902

2904

2906

2908

2910

2912

2914

2916

2918

2920

2922

2924

2926

2928

2930

2932

2934

2936

2938

2940

2942

2944

2946

2948

2950

2952

2954

2956

2958

2960

2962

2964

2966

2968

2970

2972

2974

2976

2978

2980

2982

2984

2986

2988

2990

2992

2994

2996

2998

3000

3002

3004

3006

3008

3010

3012

3014

3016

3018

3020

3022

3024

3026

3028

3030

3032

3034

3036

3038

3040

3042

3044

3046

3048

3050

3052

3054

3056

3058

3060

3062

3064

3066

3068

3070

3072

3074

3076

3078

3080

3082

3084

3086

3088

3090

3092

3094

3096

3098

3100

3102

3104

3106

3108

3110

3112

3114

3116

3118

3120

3122

3124

3126

3128

3130

3132

3134

3136

3138

3140

3142

3144

3146

3148

3150

3152

3154

3156

3158

3160

3162

3164

3166

3168

3170

3172

3174

3176

3178

3180

3182

3184

3186

3188

3190

3192

3194

3196

3198

3200

3202

3204

3206

3208

3210

3212

3214

3216

3218

3220

3222

3224

3226

3228

3230

3232

3234

3236

3238

3240

3242

3244

3246

3248

3250

3252

3254

3256

3258

3260

3262

3264

3266

3268

3270

3272

3274

3276

3278

3280

3282

3284

3286

3288

3290

3292

3294

3296

3298

3300

3302

3304

3306

3308

3310

3312

3314

3316

3318

3320

3322

3324

3326

3328

3330

3332

3334

3336

3338

3340

3342

3344

3346

3348

3350

3352

3354

3356

3358

3360

3362

3364

3366

3368

3370

3372

3374

3376

3378

3380

3382

3384

3386

3388

3390

3392

3394

3396

3398

3400

3402

3404

3406

3408

3410

3412

3414

3416

3418

3420

3422

3424

3426

3428

3430

3432

3434

3436

3438

3440

3442

3444

3446

3448

3450

3452

3454

3456

3458

3460

3462

3464

3466

3468

3470

3472

3474

3476

3478

3480

3482

3484

3486

3488

3490

3492

3494

3496

3498

3500

3502

3504

3506

3508

3510

3512

3514

3516

3518

3520

3522

3524

3526

3528

3530

3532

3534

3536

3538

3540

3542

3544

3546

3548

3550

3552

3554

3556

3558

3560

3562

3564

3566

3568

3570

3572

3574

3576

3578

3580

3582

3584

3586

3588

3590

3592

3594

3596

3598

3600

3602

3604

3606

3608

3610

3612

3614

3616

3618

3620

3622

3624

3626

3628

3630

3632

3634

3636

3638

3640

3642

3644

3646

3648

3650

3652

3654

3656

3658

3660

3662

3664

3666

3668

3670

3672

3674

3676

3678

3680

3682

3684

3686

3688

3690

3692

3694

3696

3698

3700

3702

3704

3706

3708

3710

3712</

11/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://georgetown1/Blackout_v30i/bb_admin/frames/frame_enterprise_courses.html Go

Your Institution UNIVERSITY

Home Help Logout

My Institution Courses Communities Courses Academic Web Resources

COURSES > INTRODUCTION TO MUSIC

MUSIC101: Introduction to Music

Announcements

Course Information

Staff Information

Course Documents

Assignments

Communication

External Links

Student Tools

Resources

Course Map

Control Panel

Course Documents

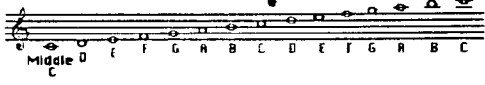
[Top]

Current Location: Course Documents

Syllabus
[Link to File](#)

Session 1
The major scale, has no sharps or flats associated with any of the notes in the scale. Here is the C major scale in the treble staff.

(to display options for the animation below, move your mouse pointer atop the image and click the right mouse button)



Session 1: Lessons

Session 1: An Atlas of Consonance
[Link to File](#)
Please print this document and keep it available for fast review.

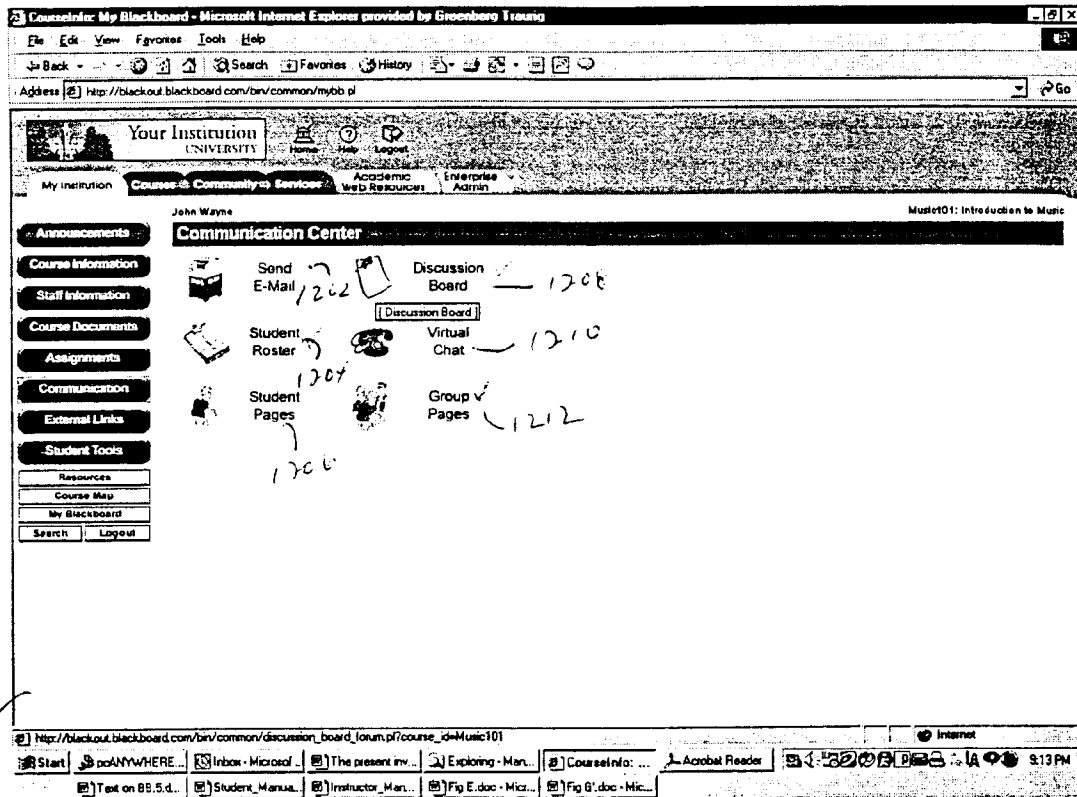
Session 2: Music Notation

Done Local intranet

1100

Fig 11

12/41



1200

FIG. 12

1300

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://blackout.blackboard.com/bb_adminv/frames/frame_enterprise_courses.html

Your Institution UNIVERSITY

Home Help Logout

My Institution Courses Community Services Web Resources Enterprise Admin

COURSES > INTRODUCTION TO MUSIC

Blackboard Administrator MUSIC101: Introduction to Music

Communication Center

Discussion Board - Thread View

VIEW UNREAD MESSAGES EXPAND ALL COLLAPSE ALL SEARCH

OPTIONS

SELECT ALL Deselect INVERT READ UNREAD COLLECT

Thread	Author	Date	Status
<input type="checkbox"/> This is a top level thread	Cane, Daniel	25-Feb-2000	
<input type="checkbox"/> This is a reply to your top level thread	Chi, Timothy	26-Feb-2000	New
<input type="checkbox"/> This is a top level thread	Cane, Daniel	28-Feb-2000	New
<input type="checkbox"/> Hello World!	Klimenko, Anatoliy	27-Feb-2000	New
<input type="checkbox"/> Re: Hello World!	Klimenko, Anatoliy	28-Feb-2000	New

[[Click Here for Archives](#)]

Sort By: Default

Previous

Done Internet

FIG. 13

WO 01/01372

PCT/US00/17979

14/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Greenberg Learning

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://blackboard.blackboard.com/bin/common/mybb.pl

Your Institution UNIVERSITY

My Institution Courses in Community to Services Academic Enterprise Admin

John Wayne Music101: Introduction to Music

Announcements

Course Information

Staff Information

Course Documents

Assignments

Communication

External Links

Student Tools

Resources

Course Map

My Blackboard

Search Logout

Student Drop Box

Change Your Information

Check Your Grade

Edit Your Homepage

Student Calendar

Student Manual

1422

1424

1426

1428

1406

1408

1410

1412

1406

1408

1410

1412

1406

1408

1410

1412

1406

1408

1410

1412

Done

Start poANYWHERE Inbox - Microsol The present inv... Exploring - Men... CourseInfo: ... Acrobat Reader

Test on BB 5.d... Student Manual... Instructor Man...

Internet

9:11 PM

FIG. 14

15/41

Student Tools: Student DropBox

John Wayne

Music101: Introduction to Music

Student Tools

Student DropBox

Use your student drop box to submit files to your instructor. Also, your instructor can return your files to you with comments attached.



Current Files in your DropBox

Note: If you want to save a file, right click on the Link Name and choose Save Link As

<u>File Name</u>	<u>Link Name</u>	<u>File Size</u>	<u>Status</u>
none	none	none	none

[Remove Files]



Add File to DropBox

Click the *Browse* button to select the file to attach from your computer. Be sure to specify a linkname for your file.

File to Upload:

Name of Link to File:

(Example: *Homework One, Assignment One*)

Browse...

Send File to Instructor

◀ Back

1520

FILE 15

16141

CourseIndex: My Blackboard - Microsoft Internet Explorer provided by Greenberg Traurig

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://blackout.blackboard.com/course/instructor/index.htm

Your Institution UNIVERSITY

My Institution Courses Community & Services Academic Web Resources Enterprise Admin

COURSES > INTRODUCTION TO MUSIC > CONTROL PANEL

MUSIC101: Introduction to Music
Dr. Tim Case, Instructor

1604 CONTENT AREA

Announcements 1616
Course Information 1618
Staff Information 1620

1606 COURSE TOOLS

Course Calendar 1622
Course Tasks 1630
Send E-Mail 1632
Instructor Library 1634

1608 COURSE OPTIONS

Course Options 1642
Course Properties 1644
Course Utilities 1646

1610 USER MANAGEMENT

Add Users 1652
List / Modify Users 1654
Remove Users 1656

1612 ASSESSMENT

Assessment Manager 1660
Pool Manager 1662

1614 ASSISTANCE

Online Manual 1668
Online Support 1670
Contact Admin 1672

1622 Course Documents
Assignments 1624
External Links 1626

1638 Discussion Board
Virtual Classroom 1636
Digital Dropbox 1640

1648 Course Images
Academic Web Resources
Course Marketing 1650

1664 Online Gradebook
Course Statistics 1666

1660 Start
1662 poANYW...
1664 Inbox - M...
1666 Exploring...
1668 Test on B...
1670 Coursel...
1672 Fig Q.doc...
1674 Document...
1676 Document...
1678 1680 1682 1684 1686 1688 1690 1692 1694 1696 1698 1700 1702 1704 1706 1708 1710 1712 1714 1716 1718 1720 1722 1724 1726 1728 1730 1732 1734 1736 1738 1740 1742 1744 1746 1748 1750 1752 1754 1756 1758 1760 1762 1764 1766 1768 1770 1772 1774 1776 1778 1780 1782 1784 1786 1788 1790 1792 1794 1796 1798 1800 1802 1804 1806 1808 1810 1812 1814 1816 1818 1820 1822 1824 1826 1828 1830 1832 1834 1836 1838 1840 1842 1844 1846 1848 1850 1852 1854 1856 1858 1860 1862 1864 1866 1868 1870 1872 1874 1876 1878 1880 1882 1884 1886 1888 1890 1892 1894 1896 1898 1900 1902 1904 1906 1908 1910 1912 1914 1916 1918 1920 1922 1924 1926 1928 1930 1932 1934 1936 1938 1940 1942 1944 1946 1948 1950 1952 1954 1956 1958 1960 1962 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018 2020 2022 2024 2026 2028 2030 2032 2034 2036 2038 2040 2042 2044 2046 2048 2050 2052 2054 2056 2058 2060 2062 2064 2066 2068 2070 2072 2074 2076 2078 2080 2082 2084 2086 2088 2090 2092 2094 2096 2098 2100 2102 2104 2106 2108 2110 2112 2114 2116 2118 2120 2122 2124 2126 2128 2130 2132 2134 2136 2138 2140 2142 2144 2146 2148 2150 2152 2154 2156 2158 2160 2162 2164 2166 2168 2170 2172 2174 2176 2178 2180 2182 2184 2186 2188 2190 2192 2194 2196 2198 2200 2202 2204 2206 2208 2210 2212 2214 2216 2218 2220 2222 2224 2226 2228 2230 2232 2234 2236 2238 2240 2242 2244 2246 2248 2250 2252 2254 2256 2258 2260 2262 2264 2266 2268 2270 2272 2274 2276 2278 2280 2282 2284 2286 2288 2290 2292 2294 2296 2298 2300 2302 2304 2306 2308 2310 2312 2314 2316 2318 2320 2322 2324 2326 2328 2330 2332 2334 2336 2338 2340 2342 2344 2346 2348 2350 2352 2354 2356 2358 2360 2362 2364 2366 2368 2370 2372 2374 2376 2378 2380 2382 2384 2386 2388 2390 2392 2394 2396 2398 2400 2402 2404 2406 2408 2410 2412 2414 2416 2418 2420 2422 2424 2426 2428 2430 2432 2434 2436 2438 2440 2442 2444 2446 2448 2450 2452 2454 2456 2458 2460 2462 2464 2466 2468 2470 2472 2474 2476 2478 2480 2482 2484 2486 2488 2490 2492 2494 2496 2498 2500 2502 2504 2506 2508 2510 2512 2514 2516 2518 2520 2522 2524 2526 2528 2530 2532 2534 2536 2538 2540 2542 2544 2546 2548 2550 2552 2554 2556 2558 2560 2562 2564 2566 2568 2570 2572 2574 2576 2578 2580 2582 2584 2586 2588 2590 2592 2594 2596 2598 2600 2602 2604 2606 2608 2610 2612 2614 2616 2618 2620 2622 2624 2626 2628 2630 2632 2634 2636 2638 2640 2642 2644 2646 2648 2650 2652 2654 2656 2658 2660 2662 2664 2666 2668 2670 2672 2674 2676 2678 2680 2682 2684 2686 2688 2690 2692 2694 2696 2698 2700 2702 2704 2706 2708 2710 2712 2714 2716 2718 2720 2722 2724 2726 2728 2730 2732 2734 2736 2738 2740 2742 2744 2746 2748 2750 2752 2754 2756 2758 2760 2762 2764 2766 2768 2770 2772 2774 2776 2778 2780 2782 2784 2786 2788 2790 2792 2794 2796 2798 2800 2802 2804 2806 2808 2810 2812 2814 2816 2818 2820 2822 2824 2826 2828 2830 2832 2834 2836 2838 2840 2842 2844 2846 2848 2850 2852 2854 2856 2858 2860 2862 2864 2866 2868 2870 2872 2874 2876 2878 2880 2882 2884 2886 2888 2890 2892 2894 2896 2898 2900 2902 2904 2906 2908 2910 2912 2914 2916 2918 2920 2922 2924 2926 2928 2930 2932 2934 2936 2938 2940 2942 2944 2946 2948 2950 2952 2954 2956 2958 2960 2962 2964 2966 2968 2970 2972 2974 2976 2978 2980 2982 2984 2986 2988 2990 2992 2994 2996 2998 3000 3002 3004 3006 3008 3010 3012 3014 3016 3018 3020 3022 3024 3026 3028 3030 3032 3034 3036 3038 3040 3042 3044 3046 3048 3050 3052 3054 3056 3058 3060 3062 3064 3066 3068 3070 3072 3074 3076 3078 3080 3082 3084 3086 3088 3090 3092 3094 3096 3098 3100 3102 3104 3106 3108 3110 3112 3114 3116 3118 3120 3122 3124 3126 3128 3130 3132 3134 3136 3138 3140 3142 3144 3146 3148 3150 3152 3154 3156 3158 3160 3162 3164 3166 3168 3170 3172 3174 3176 3178 3180 3182 3184 3186 3188 3190 3192 3194 3196 3198 3200 3202 3204 3206 3208 3210 3212 3214 3216 3218 3220 3222 3224 3226 3228 3230 3232 3234 3236 3238 3240 3242 3244 3246 3248 3250 3252 3254 3256 3258 3260 3262 3264 3266 3268 3270 3272 3274 3276 3278 3280 3282 3284 3286 3288 3290 3292 3294 3296 3298 3300 3302 3304 3306 3308 3310 3312 3314 3316 3318 3320 3322 3324 3326 3328 3330 3332 3334 3336 3338 3340 3342 3344 3346 3348 3350 3352 3354 3356 3358 3360 3362 3364 3366 3368 3370 3372 3374 3376 3378 3380 3382 3384 3386 3388 3390 3392 3394 3396 3398 3400 3402 3404 3406 3408 3410 3412 3414 3416 3418 3420 3422 3424 3426 3428 3430 3432 3434 3436 3438 3440 3442 3444 3446 3448 3450 3452 3454 3456 3458 3460 3462 3464 3466 3468 3470 3472 3474 3476 3478 3480 3482 3484 3486 3488 3490 3492 3494 3496 3498 3500 3502 3504 3506 3508 3510 3512 3514 3516 3518 3520 3522 3524 3526 3528 3530 3532 3534 3536 3538 3540 3542 3544 3546 3548 3550 3552 3554 3556 3558 3560 3562 3564 3566 3568 3570 3572 3574 3576 3578 3580 3582 3584 3586 3588 3590 3592 3594 3596 3598 3600 3602 3604 3606 3608 3610 3612 3614 3616 3618 3620 3622 3624 3626 3628 3630 3632 3634 3636 3638 3640 3642 3644 3646 3648 3650 3652 3654 3656 3658 3660 3662 3664 3666 3668 3670 3672 3674 3676 3678 3680 3682 3684 3686 3688 3690 3692 3694 3696 3698 3700 3702 3704 3706 3708 3710 3712 3714 3716 3718 3720 3722 3724 3726 3728 3730 3732 3734 3736 3738 3740 3742 3744 3746 3748 3750 3752 3754 3756 3758 3760 3762 3764 3766 3768 3770 3772 3774 3776 3778 3780 3782 3784 3786 3788 3790 3792 3794 3796 3798 3800 3802 3804 3806 3808 3810 3812 3814 3816 3818 3820 3822 3824 3826 3828 3830 3832 3834 3836 3838 3840 3842 3844 3846 3848 3850 3852 3854 3856 3858 3860 3862 3864 3866 3868 3870 3872 3874 3876 3878 3880 3882 3884 3886 3888 3890 3892 3894 3896 3898 3900 3902 3904 3906 3908 3910 3912 3914 3916 3918 3920 3922 3924 3926 3928 3930 3932 3934 3936 3938 3940 3942 3944 3946 3948 3950 3952 3954 3956 3958 3960 3962 3964 3966 3968 3970 3972 3974 3976 3978 3980 3982 3984 3986 3988 3990 3992 3994 3996 3998 4000 4002 4004 4006 4008 4010 4012 4014 4016 4018 4020 4022 4024 4026 4028 4030 4032 4034 4036 4038 4040 4042 4044 4046 4048 4050 4052 4054 4056 4058 4060 4062 4064 4066 4068 4070 4072 4074 4076 4078 4080 4082 4084 4086 4088 4090 4092 4094 4096 4098 4100 4102 4104 4106 4108 4110 4112 4114 4116 4118 4120 4122 4124 4126 4128 4130 4132 4134 4136 4138 4140 4142 4144 4146 4148 4150 4152 4154 4156 4158 4160 4162 4164 4166 4168 4170 4172 4174 4176 4178 4180 4182 4184 4186 4188 4190 4192 4194 4196 4198 4200 4202 4204 4206 4208 4210 4212 4214 4216 4218 4220 4222 4224 4226 4228 4230 4232 4234 4236 4238 4240 4242 4244 4246 4248 4250 4252 4254 4256 4258 4260 4262 4264 4266 4268 4270 4272 4274 4276 4278 4280 4282 4284 4286 4288 4290 4292 4294 4296 4298 4300 4302 4304 4306 4308 4310 4312 4314 4316 4318 4320 4322 4324 4326 4328 4330 4332 4334 4336 4338 4340 4342 4344 4346 4348 4350 4352 4354 4356 4358 4360 4362 4364 4366 4368 4370 4372 4374 4376 4378 4380 4382 4384 4386 4388 4390 4392 4394 4396 4398 4400 4402 4404 4406 4408 4410 4412 4414 4416 4418 4420 4422 4424 4426 4428 4430 4432 4434 4436 4438 4440 4442 4444 4446 4448 4450 4452 4454 4456 4458 4460 4462 4464 4466 4468 4470 4472 4474 4476 4478 4480 4482 4484 4486 4488 4490 4492 4494 4496 4498 4500 4502 4504 4506 4508 4510 4512 4514 4516 4518 4520 4522 4524 4526 4528 4530 4532 4534 4536 4538 4540 4542 4544 4546 4548 4550 4552 4554 4556 4558 4560 4562 4564 4566 4568 4570 4572 4574 4576 4578 4580 4582 4584 4586 4588 4590 4592 4594 4596 4598 4600 4602 4604 4606 4608 4610 4612 4614 4616 4618 4620 4622 4624 4626 4628 4630 4632 4634 4636 4638 4640 4642 4644 4646 4648 4650 4652 4654 4656 4658 4660 4662 4664 4666 4668 4670 4672 4674 4676 4678 4680 4682 4684 4686 4688 4690 4692 4694 4696 4698 4700 4702 4704 4706 4708 4710 4712 4714 4716 4718 4720 4722 4724 4726 4728 4730 4732 4734 4736 4738 4740 4742 4744 4746 4748 4750 4752 4754 4756 4758 4760 4762 4764 4766 4768 4770 4772 4774 4776 4778 4780 4782 4784 4786 4788 4790 4792 4794 4796 4798 4800 4802 4804 4806 4808 4810 4812 4814 4816 4818 4820 4822 4824 4826 4828 4830 4832 4834 4836 4838 4840 4842 4844 4846 4848 4850 4852 4854 4856 4858 4860 4862 4864 4866 4868 4870 4872 4874 4876 4878 4880 4882 4884 4886 4888 4890 4892 4894 4896 4898 4900 4902 4904 4906 4908 4910 4912 4914 4916 4918 4920 4922 4924 4926 4928 4930 4932 4934 4936 4938 4940 4942 4944 4946 4948 4950 4952 4954 4956 4958 4960 4962 4964 4966 4968 4970 4972 4974 4976 4978 4980 4982 4984 4986 4988 4990 4992 4994 4996 4998 5000 5002 5004 5006 5008 5010 5012 5014 5016 5018 5020 5022 5024 5026 5028 5030 5032 5034 5036 5038 5040 5042 5044 5046 5048 5050 5052 5054 5056 5058 5060 5062 5064 5066 5068 5070 5072 5074 5076 5078 5080 5082 5084 5086 5088 5090 5092 5094 5096 5098 5100 5102 5104 5106 5108 5110 5112 5114 5116 5118 5120 5122 5124 5126 5128 5130 5132 5134 5136 5138 5140 5142 5144 5146 5148 5150 5152 5154 5156 5158 5160 5162 5164 5166 5168 5170 5172 5174 5176 5178 5180 5182 5184 5186 5188 5190 5192 5194 5196 5198 5200 5202 5204 5206 5208 5210 5212 5214 5216 5218 5220 5222 5224 5226 5228 5230 5232 5234 5236 5238 5240 5242 5244 5246 5248 5250 5252 5254 5256 5258 5260 5262 5264 5266 5268 5270 5272 5274 5276 5278 5280 5282 5284 5286 5288 5290 5292 5294 5296 5298 5300 5302 5304 5306 5308 5310 5312 5314 5316 5318 5320 5322 5324 5326 5328 5330 5332 5334 5336 5338 5340 5342 5344 5346 5348 5350 5352 5354 5356 5358 5360 5362 5364 5366 5368 5370 5372 5374 5376 5378 5380 5382 5384 5386 5388 5390 5392 5394 5396 5398 5400 5402 5404 5406 5408 5410 5412 5414 5416 5418 5420 5422 5424 5426 5428 5430 5432 5434 5436 5438 5440 5442 5444 5446 5448 5450 5452 5454 5456 5458 5460 5462 5464 5466 5468 5470 5472 5474 5476 5478 5480 5482 5484 5486 5488 5490 5492 5494 5496 5498 5500 5502 5504 5506 5508 5510 5512 5514 5516 5518 5520 5522 5524 5526 5528 5530 5532 5534 5536 5538 5540 5542 5544 5546 5548 5550 5552 5554 5556 5558 5560 5562 5564 5566 5568 5570 5572 5574 5576 5578 5580 5582 5584 5586 5588 5590 5592 5594 5596 5598 5600 5602 5604 5606 5608 5610 5612 5614 5616 5618 5620 5622 5624 5626 5628 5630 5632 5634 5636 5638 5640 5642 5644 5646 5648 5650 5652 5654 5656 5658 5660 5662 5664 5666 5668 5670 5672 5674 5676 5678 5680 5682 5684 5686 5688 5690 5692 5694 5696 5698 5700 5702 5704 5706 5708 5710 5712 5714 5716 5718 5720 5722 5724 5726 5728 5730 5732 5734 5736 5738 5740 5742 5744 5746 5748 5750 5752 5754 5756 5758 5760 5762 5764 5766 5768 5770 5772 5774 5776 5778 5780 5782 5784 5786 5788 5790 5792 5794 5796 5798 5800 5802 5804 5806 5808 5810 5812 5814 5816 5818 5820 5822 5824 5826 5828 5830 5832 5834 5836 5838 5840 5842 5844 5846 5848 5850 5852 5854 5856 5858 5860 5862 5864 5866 5868 5870 5872 5874 5876 5878 5880 5882 5884 5886 5888 5890 5892 5894 5896 5898 5900 5902 5904 5906 5908 5910 5912 5914 5916 5918 5920 5922 5924 5926 5928 5930 5932 5934 5936 5938 5940 5942 5944 5946 5948 5950 5952 5954 5956 5958 5960 5962 5964 5966 5968 5970 5972 5974 5976 5978 5980 5982 5984 5986 5988 5990 5992 5994 5996 5998 6000 6002 6004 6006 6008 6010 6012 6014 6016 6018 6020 6022 6024 6026 6028 6030 6032 6034 6036 6038 6040 6042 6044 6046 6048 6050 6052 6054 6056 6058 6060 6062 6064 6066 6068 6070 6072 6074 6076 6078 6080 6082 6084 6086 6088 6090 6092 6094 6096 6098 6100 6102 6104 6106 6108 6110 6112 6114 6116 6118 6120 6122 6124 6126 6128 6130 6132 6134 6136 6138 6140 6142 6144 6146 6148 6150 6152 6154 6156 6158 6160 6162 6164 6166 6168 6170 6172 6174 6176 6178 6180 6182 6184 6186 6188 6190 6192 6194 6196 6198 6200 6202 6204 6206 6208 6210 6212 6214 6216 6218 6220 6222 6224 6226 6228 6230 6232 6234 6236 6238 6240 6242 6244 6246 6248 6250 6252 6254 6256 6258 6260 6262 6264 6266 6268 6270 6272 6274 6276 6278 6280 6282 6284 6286 6288 6290 6292 6294 6296 6298 6300 6302 6304 6306 6308 6310 6

17/41

1706

1702

1704

1700

CourseIndex: My Blackboard - Microsoft Internet Explorer provided by Greenberg Learning

File Edit View Favorites Tools Help

Back Search Favorites History

Address http://blackout.blackboard.com/course/instructor/index.htm

Your Institution UNIVERSITY

My Institution Courses Communications Web Resources Admin

COURSES > INTRODUCTION TO MUSIC > CONTROL PANEL > ANNOUNCEMENTS

Announcements: View Today

Add Announce

VIEW TODAY VIEW LAST 7 DAYS VIEW LAST 30 DAYS VIEW ALL

Wednesday, March 15, 2000

Permanent: Final Exam has moved!!!!
Due to the leaky roof in Warren B45, we have moved the exam to Hollister B14. The exam still begins promptly at 7pm.
Posted by Timothy Chi

Permanent: Final Exam has moved!!!!
Due to the leaky roof in Warren B45, we have moved the exam to Hollister B14. The exam still begins promptly at 7pm.
Posted by Timothy Chi

Wednesday, Mar 15, 2000: New Floods Threaten Mozambique
Two days of heavy rain have disrupted the distribution of food to flooded communities in central Mozambique. The main road from the port of Beira to the small town of Save has again been cut. Helicopters were called in on Tuesday to rescue 30 people and sacks of food from vehicles trapped on the road by flood water.
Posted by Dr. Kargala

Wednesday, Mar 15, 2000: NCAA: Michigan St. Arizona in First-Day Action
Big Ten Conference champion Michigan State, a Final Four team last season, and Pac-10 winner Arizona are the leading seeds in action when the NCAA Tournament - and March Madness - begins Thursday. Michigan State (26-7) is the top team in the Midwest, a region which features Big 12 champion Iowa State, Atlantic Coast Conference runner-up Maryland, Big East regular season co-champion Syracuse, and traditional powers Kentucky and UCLA. Arizona (26-6) earned the top seed in the West region after completing a sweep of Pac-10 co-champion Stanford last week. Big East tournament winner St. John's, Oklahoma, Louisiana State, Texas and Purdue are the top teams in the region. Michigan State, seeking its first national championship since Magic Johnson led the team to a title in 1979, faces 16th-seeded Valparaiso (19-12) Thursday night in Cleveland. The Spartans met in Duke in last year's Final Four.

Start pcANYWHERE Inbox - Mic... Exploring - D... Test on 88... CourseInt... Fig V.doc... Document2... Fig P.doc... Fig U.doc... Fig C.doc... Fig C.doc...

3:55 PM

FIG. 17

18/41

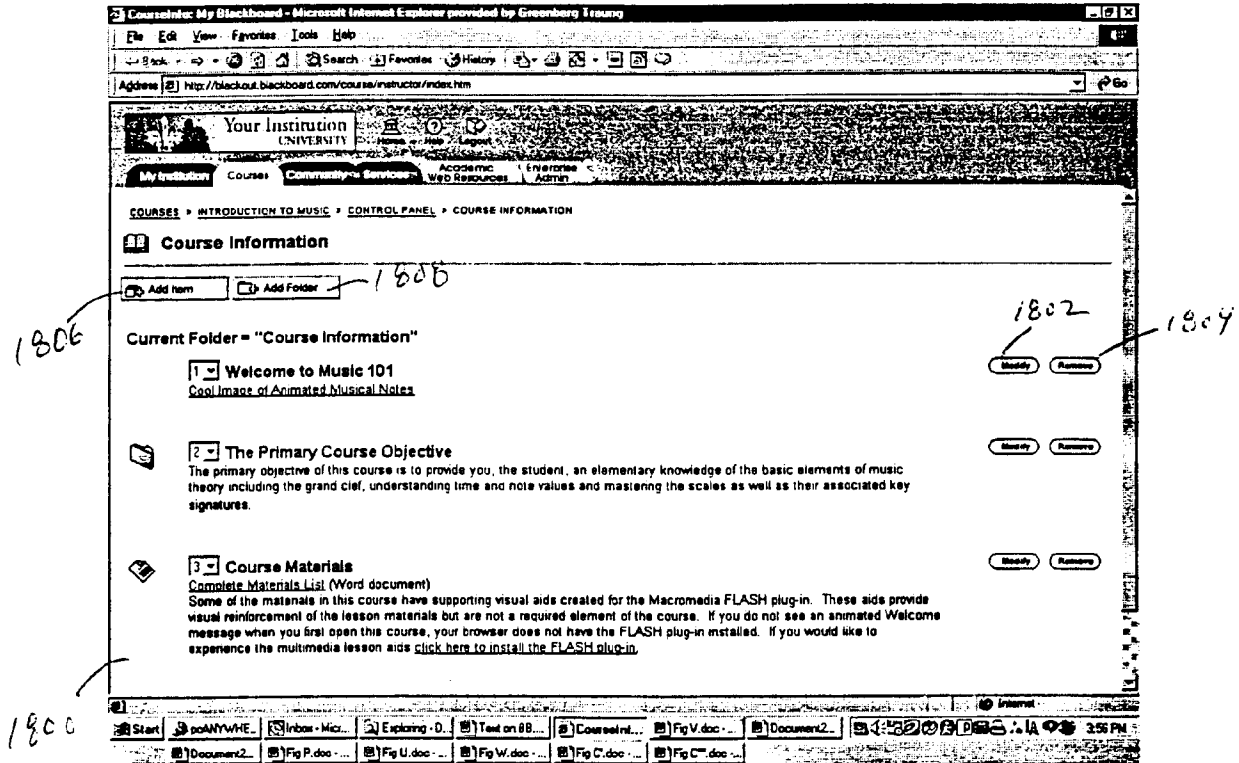


FIG. 18

WO 01/01372

PCT/US00/17979

19/41

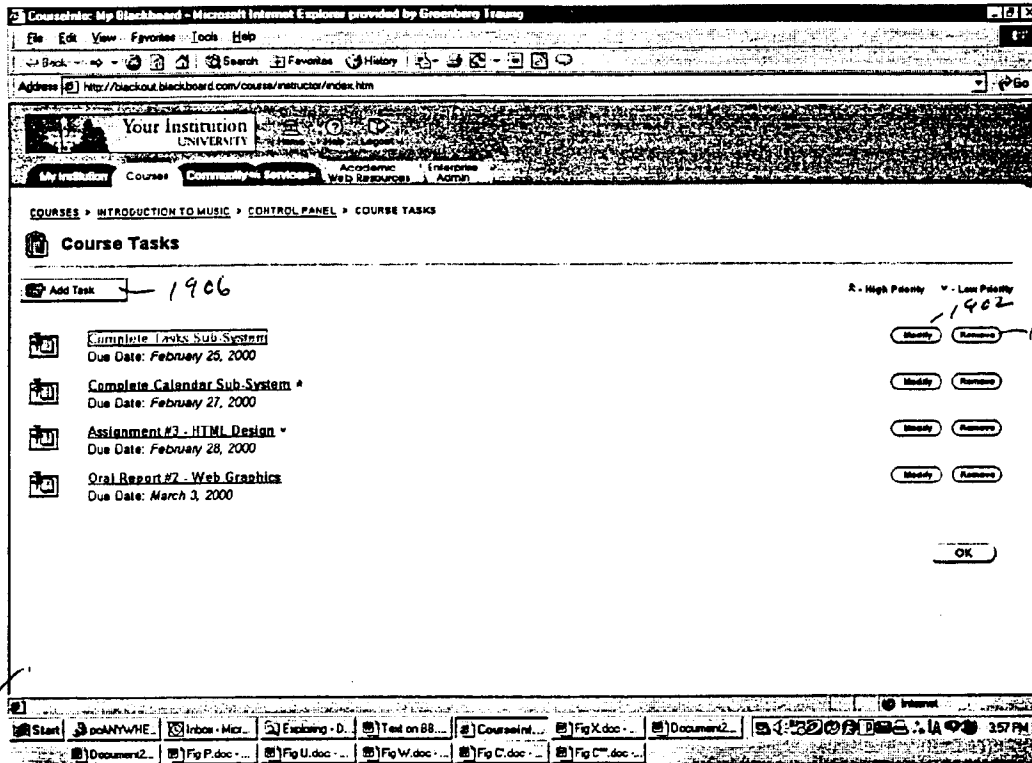
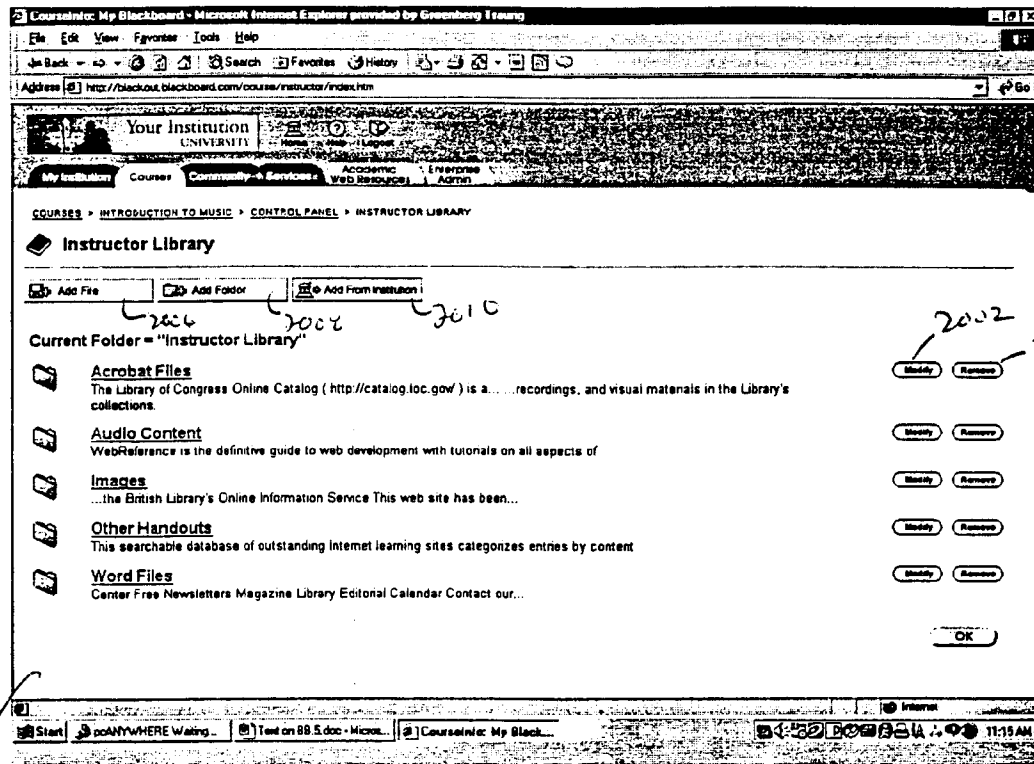


FIG 19

20/41



21/41

2102

2100

Course Info: My Blackboard - Microsoft Internet Explorer provided by Greenberg Teaching

File Edit View Favorites Tools Help

Address http://blackout.blackboard.com/course/instructor/index.htm

Your Institution UNIVERSITY

My Institution Courses Community & Services Academic Web Resources Enterprise Admin

COURSES > INTRODUCTION TO MUSIC > CONTROL PANEL > DIGITAL DROPBOX

Digital Dropbox

Add File Send File

Assignment #2 (3290)
Submitted by: Daniel Cane
Received on: February 25, 2000 9:25am

Assignment #2 (1130)
Submitted by: Tim Chi
Received on: February 24, 2000 8:27pm

Assignment #1 (920)
Submitted by: Emilio Ramos
Received on: February 24, 2000 4:48pm

Assignment #3 Draft (12930)
Posted on: February 20, 2000

Lecture #3 Outline (2960)
Posted on: February 09, 2000

Page: 1 2 3 4 5 [Next >>]

Start poANYW... Inbox - M... Exploring... Text on B... Course... Fig Z.doc... Document... Document... Fig P.doc... Fig U.doc... Fig W.doc... Fig C.doc... Fig C.d... Fig X.doc... Fig Y.doc...

Internet 4:00 PM

FIG. 21

22/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://georgetown1/Blackout_v30r/bb_admin/frames/frame_enterprise_courses.html Go

Your Institution UNIVERSITY Home Help Logout

My Institution Courses Community Services Academic Web Resources

COURSES > INTRODUCTION TO MUSIC MUSIC101: Introduction to Music

Course Gradebook

Students whose last names begin with: Items that are grouped by:

<input checked="" type="checkbox"/> - completed	Participation	Space 301-c Quiz	Assignment #1	Total Points
<input type="checkbox"/> - no info	Participation	Quiz	Assignment	
<input type="checkbox"/> - taken, but ungraded	Edit	Edit	Edit	
Arnold, Jeremy	Edit -	-	-	0
Baggins, T	Edit 80	50	50	315
Bell, Norman	Edit -	10	-	10
Cane, Jon	Edit 72	25	35	251
Chasen, Michael	Edit -	25	-	25
Chi, Timothy	Edit 92	35	50	311
Clark, Andrea	Edit 100	20	50	285
Clark, Jim	Edit 75	-	50	220
Cox, Meg	Edit -	25	-	25
Davies, Greg	Edit -	-	-	0
witkowski, francis	Edit -	10	-	10
Points Possible	100	35	50	335

Local intranet

2200

FIG 22

CourseInfo: My Blackboard

23/41

COURSES > INTRODUCTION TO MUSIC > CONTROL PANEL > COURSE STATISTICS > REPORT

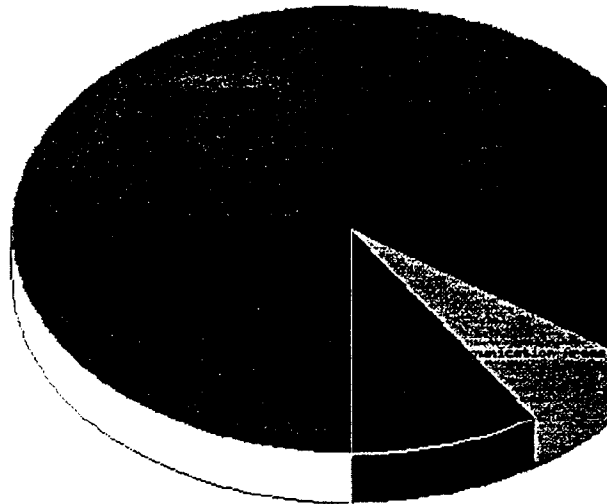
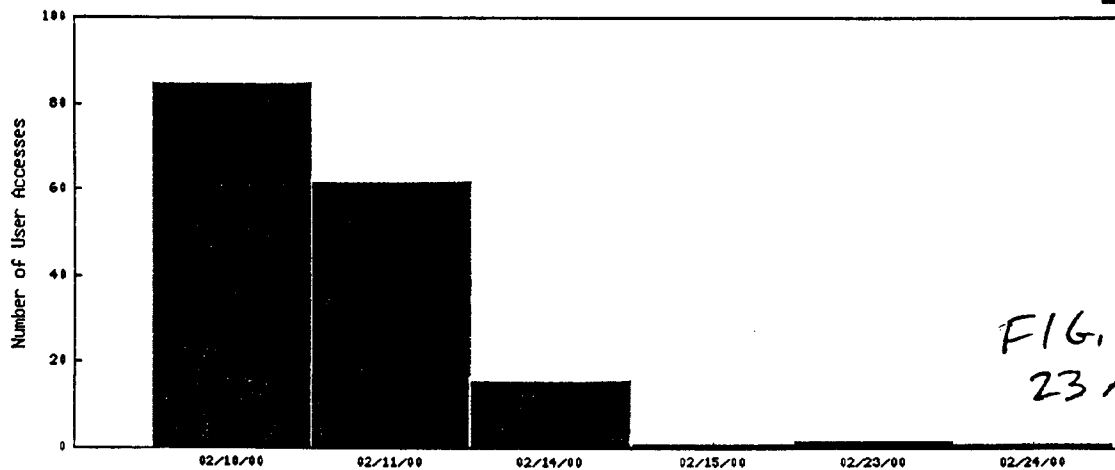
**Course Statistics**

Statistics Generated on Thursday, February 24, 2000 11:26:28 AM

Note: You may have to reload/refresh this page for the images to be correct.

Total Number of Accesses per Area — 2302Number of Accesses over Time — 2304User Accesses per Hour of the Day — 2306User Accesses per Day of the Week — 2306Total Accesses by User — 2310**Total Number of Accesses per Area** — 2302

Area Name	Hits	Percent
Content Areas	139	83.2 %
Communication Areas	10	5.98 %
Group Areas		0 %
Student Areas	15	8.98 %
Total	167	100 %

**Number of Accesses over Time** — 2304FIG.
23 A

WO 01/01372

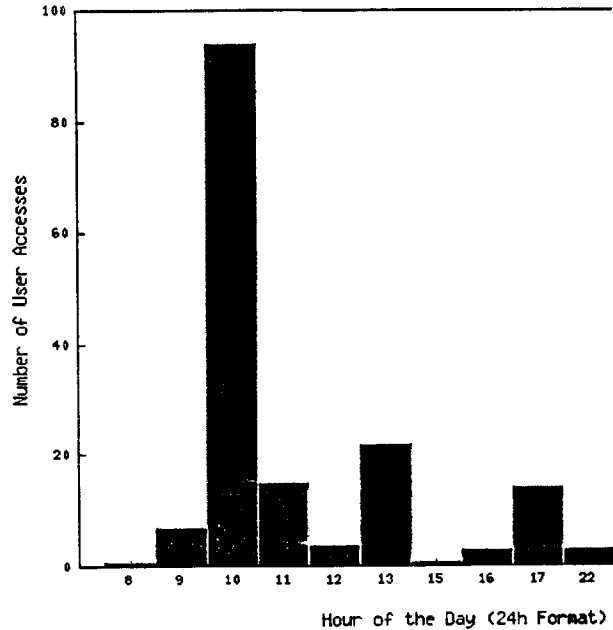
PCT/US00/17979

24/41

CourseInfo: My Blackboard

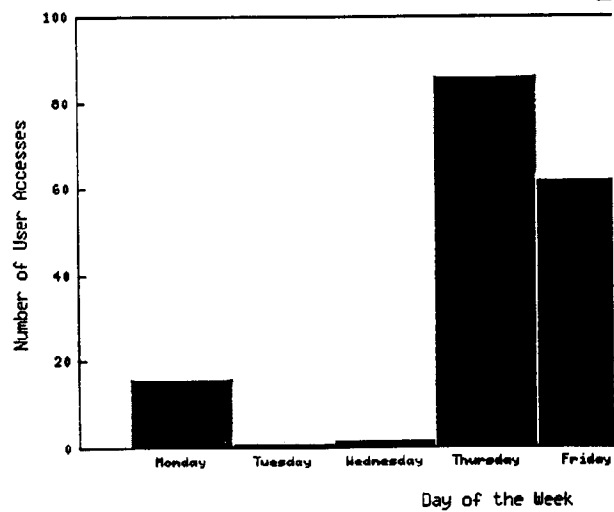
User Accesses by Hour of the Day — 2306

Hour of The Day	Hits	Percent
8	1	0.59 %
9	7	4.19 %
10	94	56.2 %
11	15	8.98 %
12	4	2.39 %
13	22	13.1 %
15	1	0.59 %
16	3	1.79 %
17	14	8.38 %
22	3	1.79 %
23	3	1.79 %
Total	167	100 %



User Accesses by Day of the Week — 2306

Day of The Week	Hits	Percent
Monday	16	9.58 %
Tuesday	1	0.59 %
Wednesday	2	1.19 %
Thursday	86	51.4 %
Friday	62	37.1 %
Total	167	100 %



2306

FIG.
23B

25/41

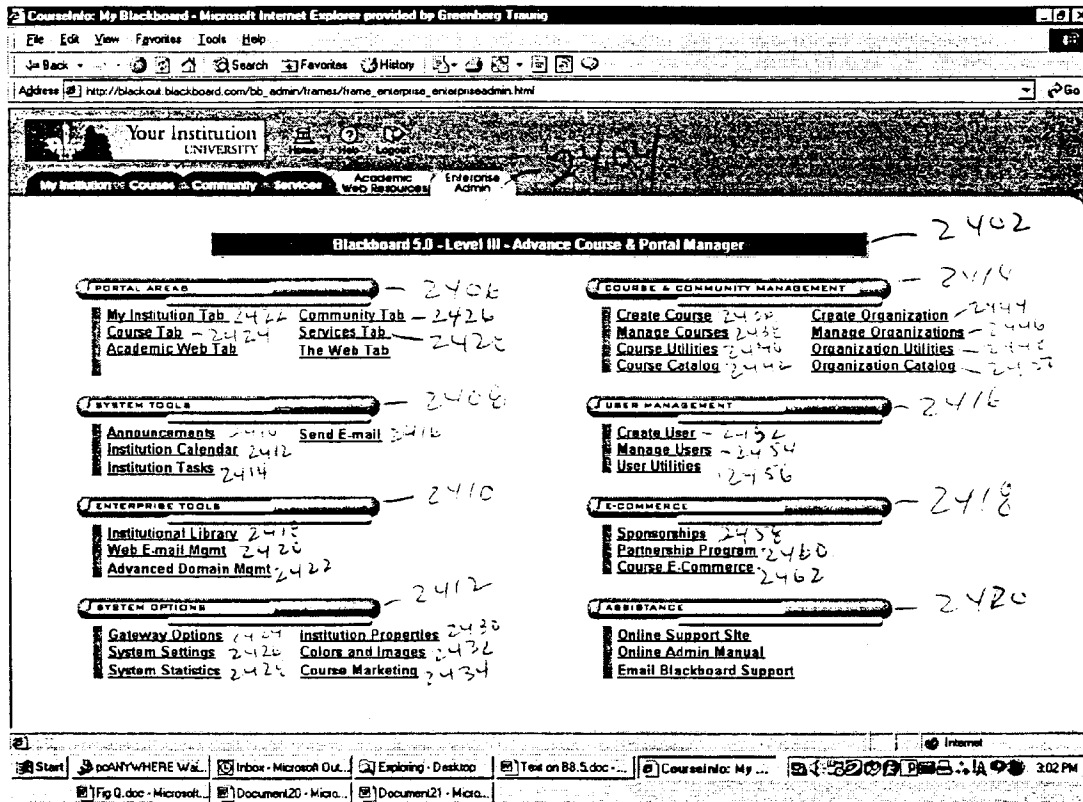
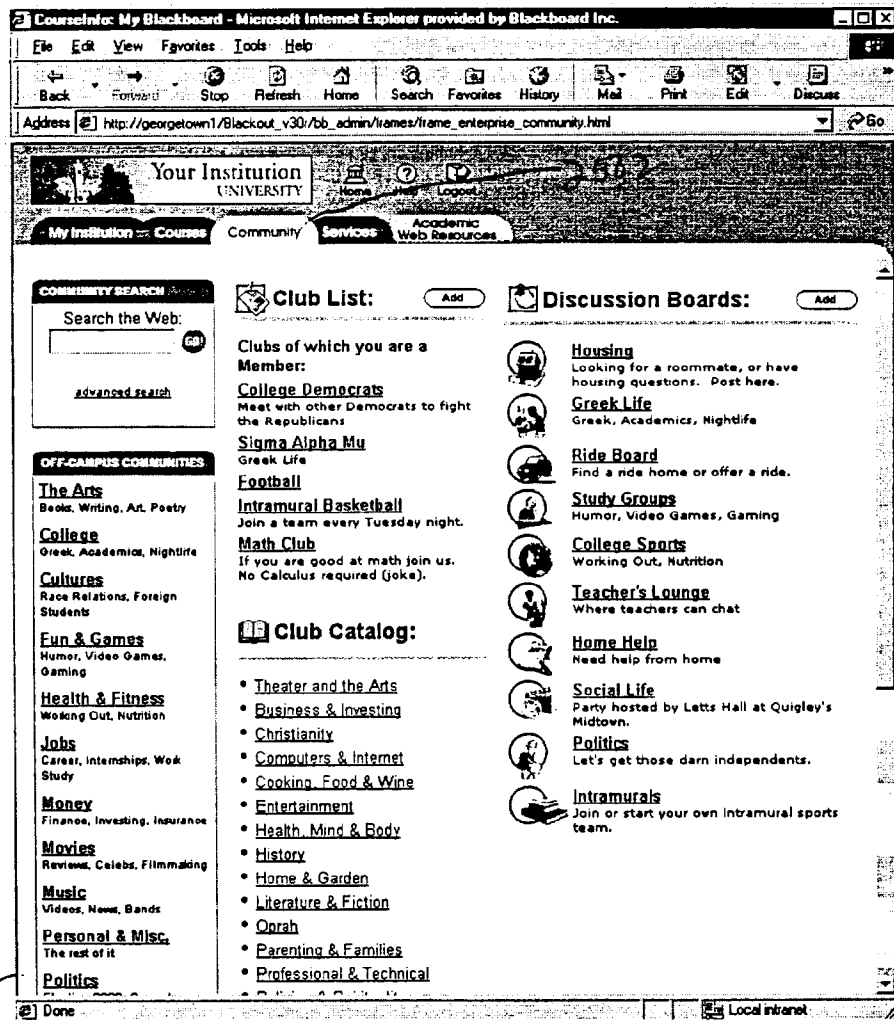


FIG. 24

26/41

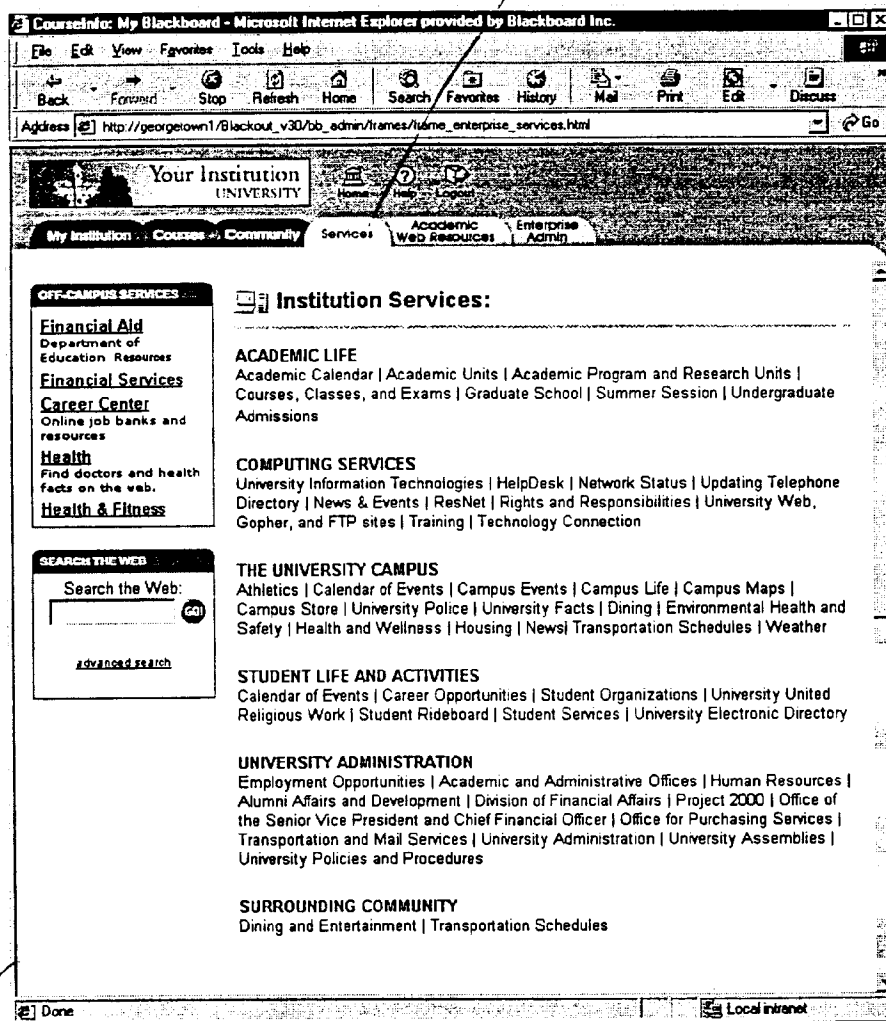


2520

Fig 25

27/41

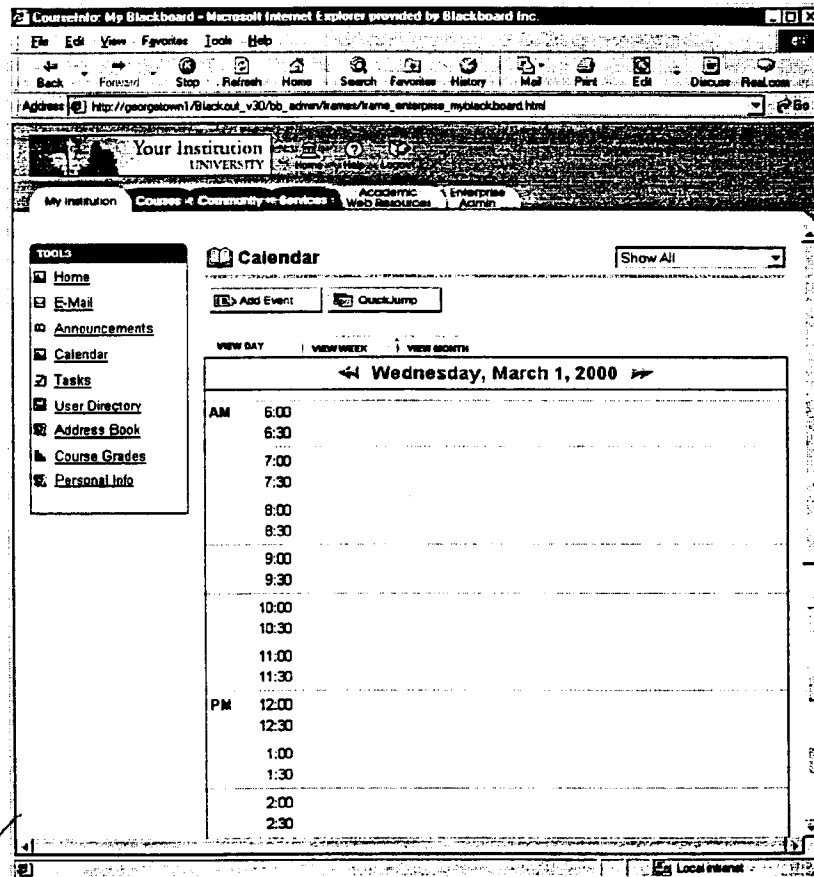
2602



2600

FIG-26

28/41



2700

FIG. 27

29/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Blackboard Inc.

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit Discuss

Address http://georgetown/Blackout_v30r/bb_admin/frames/frame_enterprise_myblackboard.html Go

Your Institution UNIVERSITY

My Institution Courses Community Services Academic Web Resources

TOOLS

- Home
- e-Mail
- Announcements
- Calendar
- Tasks
- User Directory
- Address Book
- Course Grades
- Personal Info

SEARCH THE WEB

Search the Web: GO

[advanced search](#)

Email

Open: INBOX

Face Mail

Compose Mail

Address Book

Preferences

Help

Header messages are highlighted

Content by category is shown using ascending order by date or by category name.

☒ The above list shows all messages in the Inbox, Unread, or Sent Mail message.

	FROM	SUBJECT	DATE & TIME	SIZE
<input type="checkbox"/>	"g.ess@georgetown.edu"	Check out the LDAP	19:04	503 B
<input type="checkbox"/>	"g.ess@georgetown.edu"	Check out the LDAP	19:04	503 B
<input type="checkbox"/>	"g.ess@georgetown.edu"	Check out the LDAP	19:01	512 B
<input type="checkbox"/>	"g.ess@georgetown.edu"	Check out the LDAP	19:00	503 B
<input type="checkbox"/>	"g.ess@georgetown.edu"	Web Mail	18:57	495 B

http://georgetown/Blackout_v30r/bb_admin/frames/frame_enterprise_courses.html Local intranet

FIG. 28

30/42

Course Name:

Course ID:

Description:

Course Design

Button Type:

Button Shape: ☐ Rectangular ☐ Rounded Ends ☐ Rounded Corners

Button Style:

Course Options

Subject Area:

Display:

Guest Access: ☐ Guests are allowed to visit this course.
☐ Guests are not allowed to visit this course.

3900

Guest Access: ☐ Guests are allowed to visit this course.
☐ Guests are not allowed to visit this course.

Available: ☐ Yes ☐ No

Select Course Catalog Category:

Course Cartridge (optional): Please enter your Course Cartridge Access Key:
 If you do not have an Access Key, please visit <http://cartridges.blackboard.com> to locate a Course Cartridge.

Instructor: ☐ Instructor ID:
☐ Create New Instructor

Submit

Click "Submit" to finish. Click "Cancel" to end the process.

Cancel Submit

FIG. 29

3900

31/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Greenberg Training

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://blackout.blackboard.com/tb_admin/frames/frame_enterprise_eraspseedmain.html

Your Institution UNIVERSITY

My Institution Courses Community Services Academic Web Resources Enterprise Admin

ADMINISTRATION PANEL > CREATE USER

Create User

1 Personal Information

First Name:

Middle Name:

Last Name:

E-mail:

Student ID:

2 Account Information

User Name:

Password:

Verify Password:

3 Other Information

3000

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Greenberg Training

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://blackout.blackboard.com/tb_admin/frames/frame_enterprise_eraspseedmain.html

Your Institution UNIVERSITY

My Institution Courses Community Services Academic Web Resources Enterprise Admin

Gender: ☒ Male ☐ Female

Birthday: January 1, 1976

Education: Undergraduate Student

Company:

Department:

Job Title:

Address:

Address (cont):

City:

State / Province:

Zip / Postal Code:

Country:

Web Site:

Home Phone:

Work Phone:

3000

FIG.
30A

32/41

CourseInfo: My Blackboard - Microsoft Internet Explorer provided by Greenberg Traurig

File Edit View Favorites Tools Help

Back Search Favorites History

Address http://blackout.blackboard.com/bb_admin/frames/frame_enterprise_enterpriseadmin.html Go

Your Institution UNIVERSITY

Home Help Logout

My Institution Courses Community Services Academic Web Resources Enterprise Admin

Work Phone:

Work Fax:

Mobile Phone:

4 Role and Availability

Primary Institution Role:

Administrative User Role:
If you would like user to have an administrative role, please select the role:
(Note: Administrative Access grants the user access to the System Administration Control Panel)

☒ None ☐ System Admin ☐ System Support
☐ Course Creator ☐ Account Administrator

5 Submit

* - Required Field for Form Entry

Click "Submit" to finish. Click "Cancel" to end this process.

Cancel Submit

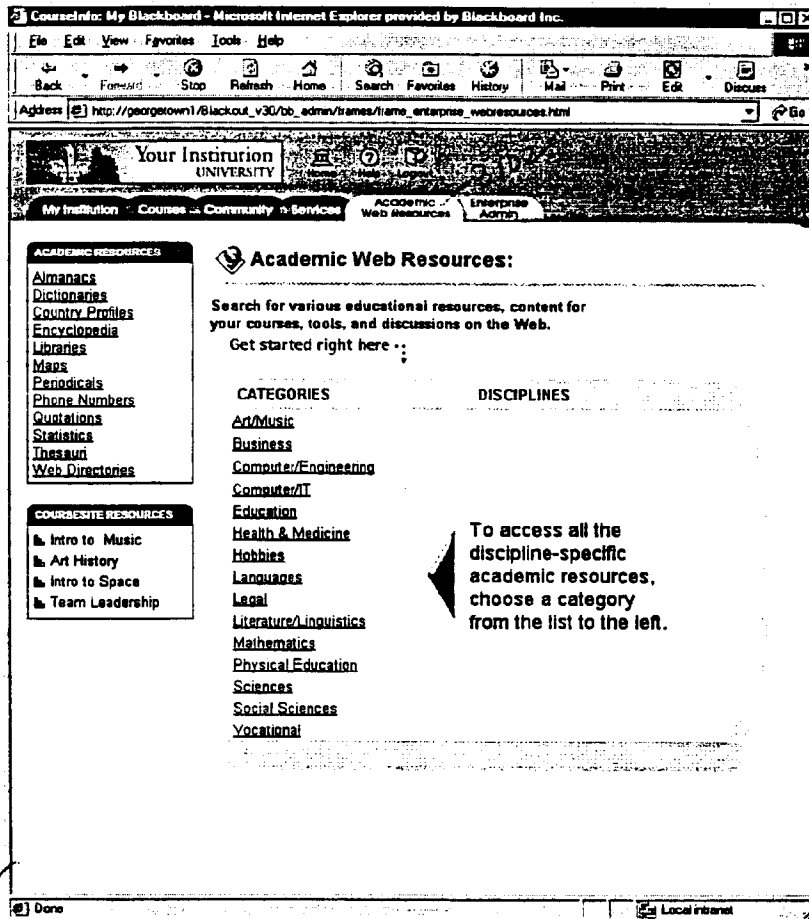
Start poANYWHERE Wa... Inbox - Microsoft Out... Exploring - Desktop Test on BB 5.doc ... CourseInfo: My ... 2001/12/20 3:19 PM

Fig Q.doc - Microsoft... Document20 - Micro... Document21 - Micro... Fig P.doc - Microsoft... Fig S.doc - Microsoft...

3000

FIG. 30B

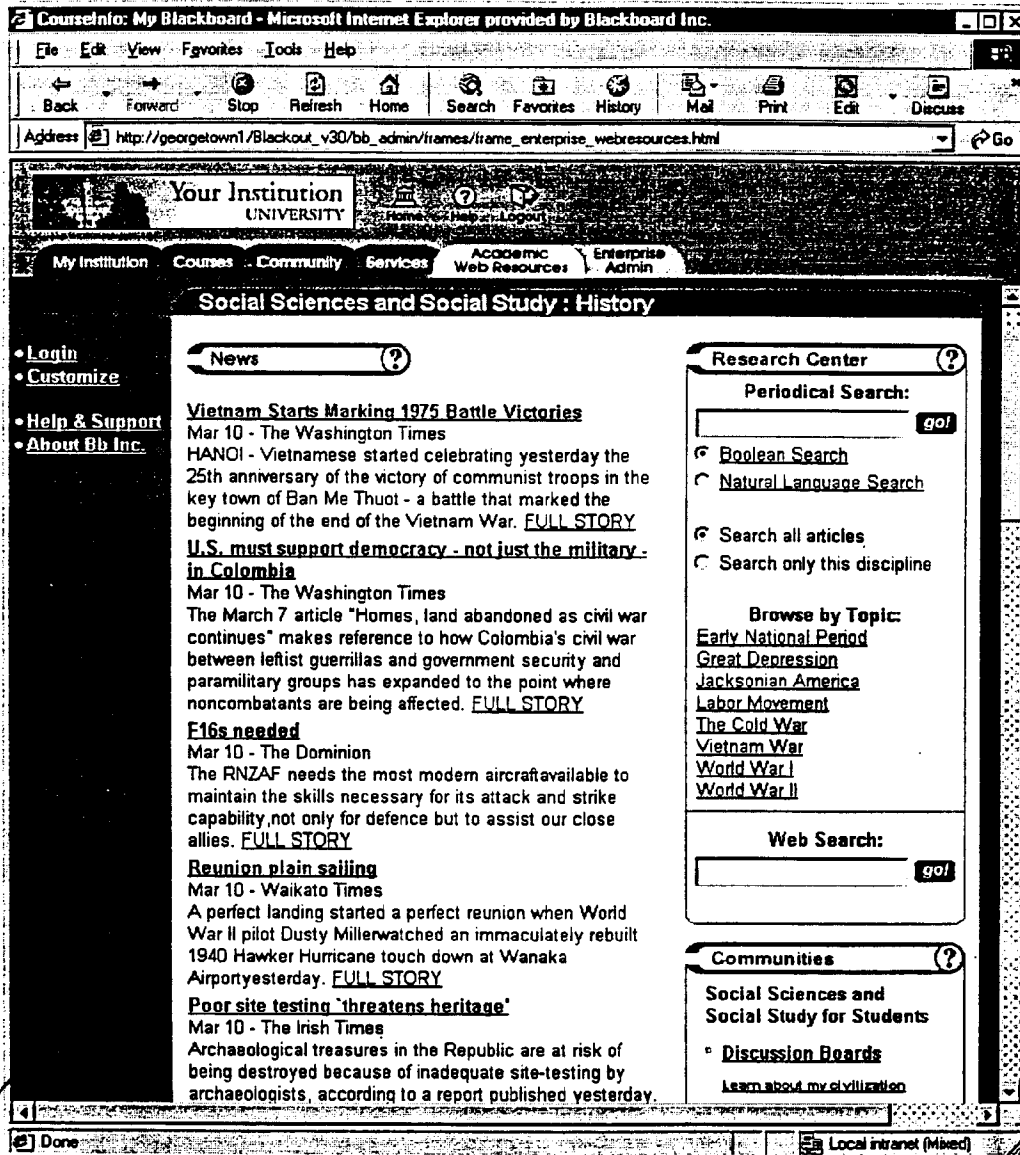
33/41



3100

FIG. 31

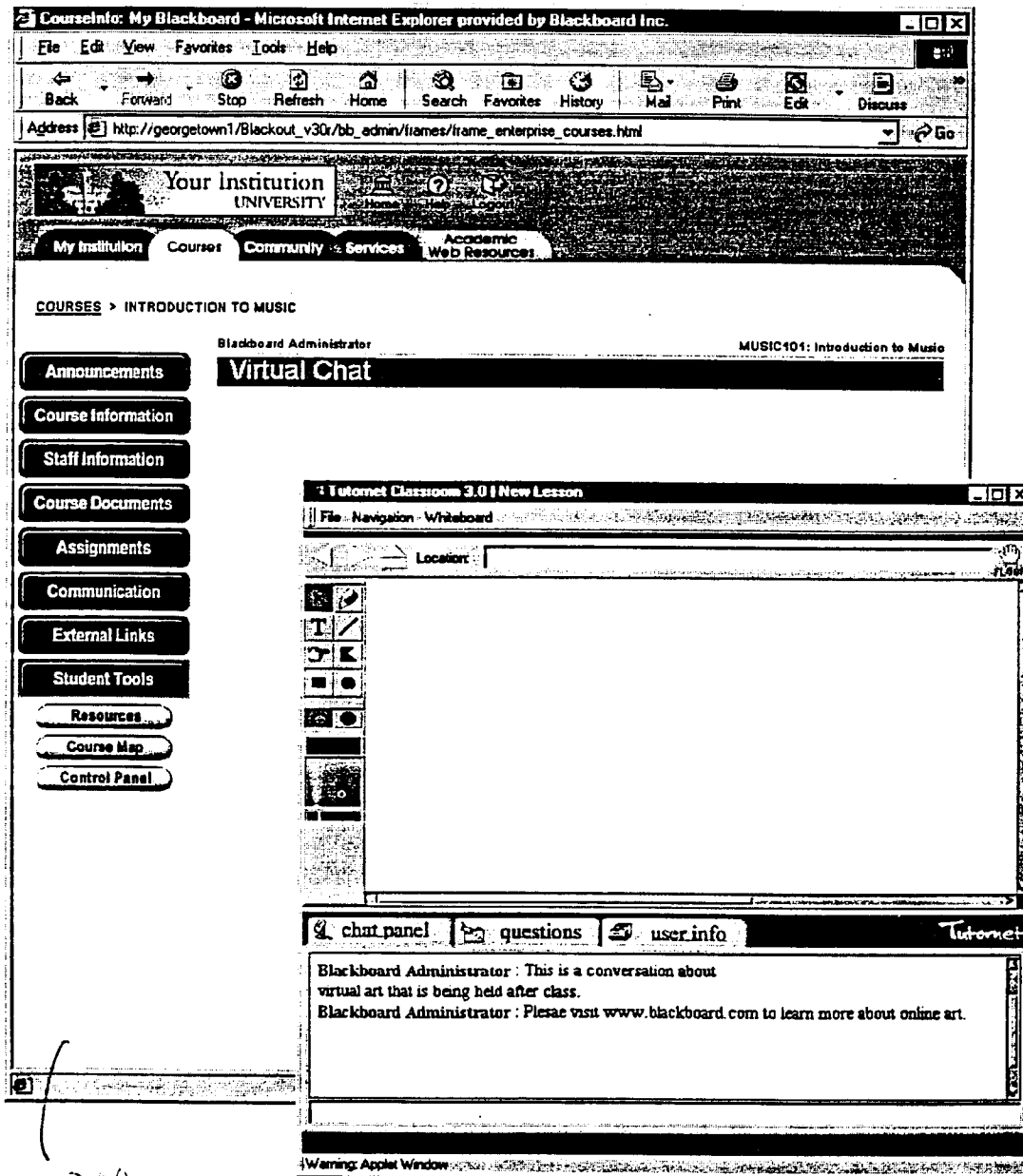
34/41



340

FIG. 32

35/41



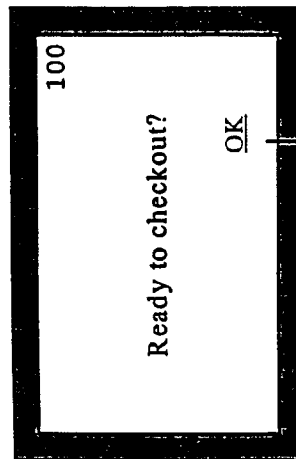
3300

FIG. 33

Attorney Docket Number: 27578.012500

Linking to the E-Commerce Server

Myserver.blackboard.com



The link to butter passes the following information:

name: Name of the purchaser

address_1

address_2

city

state

zip

country

price: price in USD that the user is being

asked to pay

order-id: null if butter should generate an

order number (default)

order-descr: Text description of what the

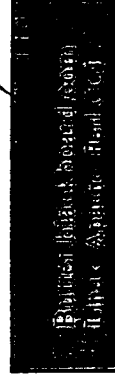
user is buying.

url: the location the referring server that

butter should return the user to after the

payment process is complete

hyperlink



Figure

34

36/42

black 120 ?

110

Attorney Docket Number: 27578.012500

First E-Commerce Screen Display

Butter.blackboard.com

Blackboard.com[™]
About Blackboard.com Help & Support Home

Payment Information

The fourth step is to fill in the required payment information and click Purchase. After a few seconds, you will be given a receipt confirming your payment. Please note that Blackboard.com uses a secure connection for its online transactions, so there is no need to worry about entering your credit card number online.

Prices listed below are in United States dollars.

Purchase Summary

Chosen Service:	Registered Course: asd4567890123456 - (\$100)
Product Number:	99121003104652
Total Price:	\$100.00

Credit Card Information

Credit Card Type:	MasterCard
Card Number:	
Expiration Date:	(mm/yy)
Name as it appears on card:	David Young
Billing address:	
City:	
State or Province:	
Zip / Postal Code:	90114
Country:	US

(Please be patient. It may take up to one minute to process your credit card.)

(Purchase)

Accepts VISA, MC, Diner's Club, JCB and Carte Blanche (but not Amex)

Whatever user info is available is populated from the data passed from the previous page.

The unique order number displayed is dynamically generated by the server.

The Chosen services and price displayed are passed in from the previous screen.

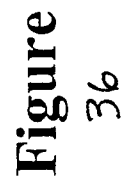
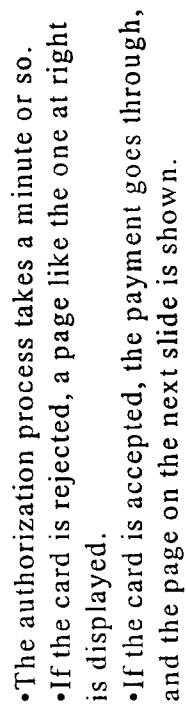
The look and feel of this plate (and all butter e-commerce pages) can be modified by an HTML template. This template is selected as one of the script parameters.

Figure

35

37/41

Authorization Process



Attorney Docket Number: 27578.012500

Second E-Commerce Screen Display

Butter.blackboard.com

Blackboard.com™
About Blackboard.com Help & Support Terms

Payment Information
Thank you for your payment. Below, you will find a purchase confirmation number for your records. Please print this page and keep it for your records. When you are done, click continue to course.

Confirmation Details

Course Number	99101400100402
Course Name	BACADDOOR (Partial number shown for security)
Course Price	100.00
Total Price	

YOU MUST CLICK HERE TO RECEIVE THE SERVICES YOU PURCHASED
[CLICKING TO CONFIRM](#)

Copyright © 1999 Blackboard Inc. All Rights Reserved
 Terms & Conditions are strictly enforced

Payment is authorized and queued at Cybercash, Inc for processing.

The payment will go through and appear in Blackboard's Cybercash account within 12 hours.

There is no way that the user can back out at this point without Blackboard issuing a manual refund.

No services are provided yet. The user must follow the link at the bottom of the page, or he will receive nothing for his money.

All links on this page are disabled except the one that says "YOU MUST CLICK HERE". This prevents users from failing to get their orders filled.

A authorization code is calculated by the script as a secure hash of the purchase price, the order id, and a secret number.

Figure

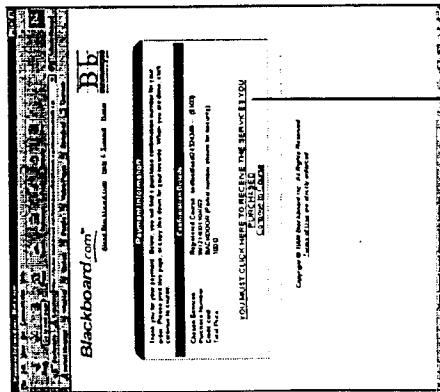
37

39641

Attorney Docket Number: 27578.012500

Returning to the Originating Server

Butter.blackboard.com



- The link at the bottom of the page points back to the referring server using the location passed in the URL parameter to the first butter script.
- The authorization code, the order_id and a subset of the credit card digits (show_card) are passed back as parameters.
- The authorization code should be checked upon return by making an identical hash calculation. If the two hash values match, the order should be fulfilled, otherwise, and error should be shown.

40/41



Figure

38

42/42

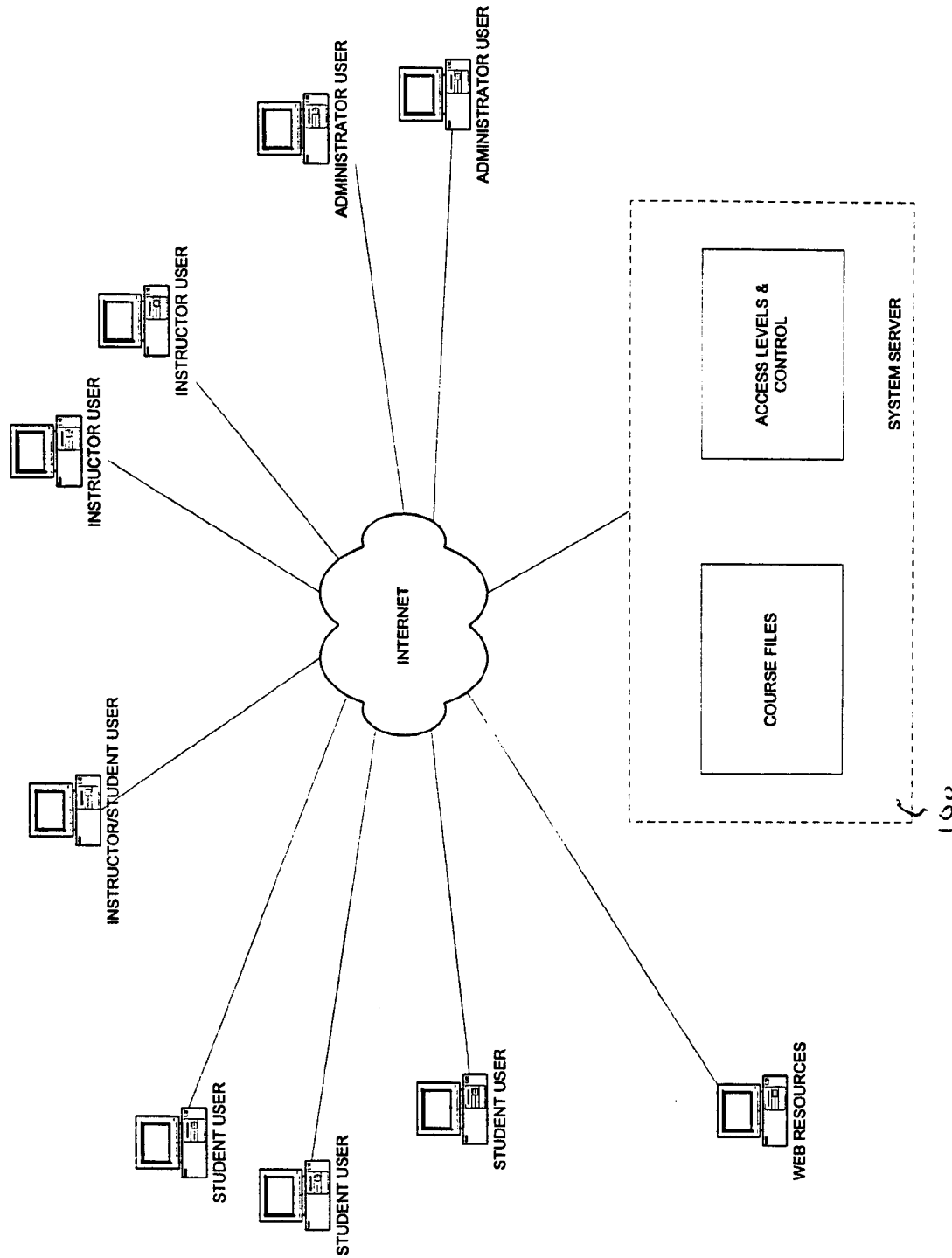


FIG. 39